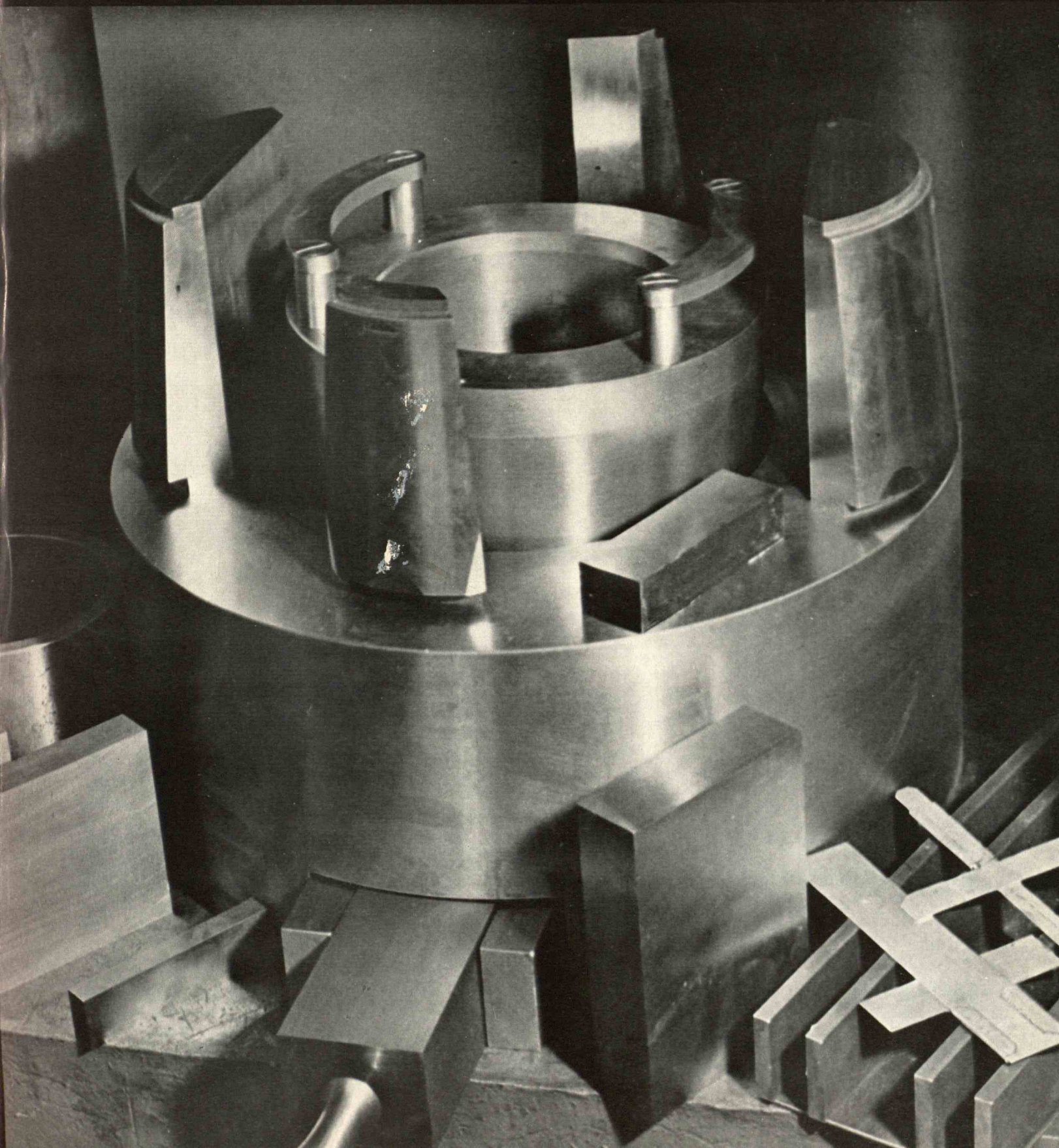


*December 1943*

# TECHNOLOGY

## REVIEW

Title Reg. in U. S. Pat. Office



# technology review

Published by MIT

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## Evening off Flamborough Head . . .

SEPTEMBER 23, 1779

The Bon Homme Richard, her decks a shambles. Raked from bow to stern. Hull blasted to a sieve, filling fast.

Shout from the Serapis' captain, "Have you struck?"

Then from his quarter deck, John Paul Jones lifted himself and his men to immortality with inspired words. Words that welled from an iron heart to set infectious courage leaping like wildfire through his crew. Words that made victory and founded naval tradition for an infant nation.

*"No! I have not yet begun to fight!"*

Today these words are still vital and inspiring at the work bench, at the bond booth—everywhere that men and women are working or fighting for victory.

PENFLEX responds with augmented effort so that more and more diesel exhausts, fuel oil feed, circulating water and starting air lines may speed the building and operation of the great armada of fighting and cargo ships that has grown from the tradition so brilliantly founded that September day.

Army and Navy requirements come first. However, if you are doing essential high priority war work and need flexible metallic tubing, write for Bulletins that will show you how PENFLEX can help you.



**PENNSYLVANIA FLEXIBLE METALLIC TUBING CO.**



Established 1902

7250 POWERS LANE • PHILADELPHIA, PA.





# He *used to be* an Expert Die Maker

## **PROTECT YOUR WORKERS' SKILL WITH AO SAFETY GOGGLES**

Not so long ago, this man was a die maker by trade. Now he is a pencil peddler by accident. Let his case remind you that unless there is a properly planned eye protection program in your plant, industrial eye accidents can rob *you, too*, of highly skilled, *irreplaceable* workers.

Let this blind man remind you, also, of the *high costs* of eye accidents . . . in medical and hospital expenses, lost time, lost manpower, lost production, idle machines, spoiled materials. Even the most minor case of "Lost-Time Eyes" costs far more than the AO Goggles that would have prevented it.

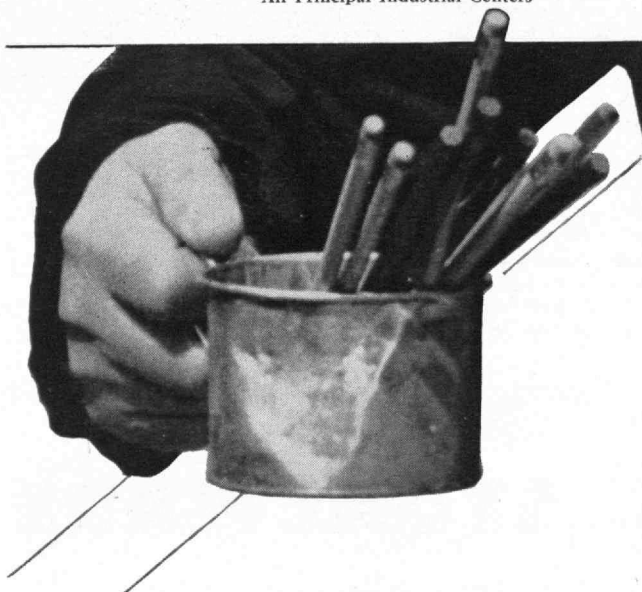
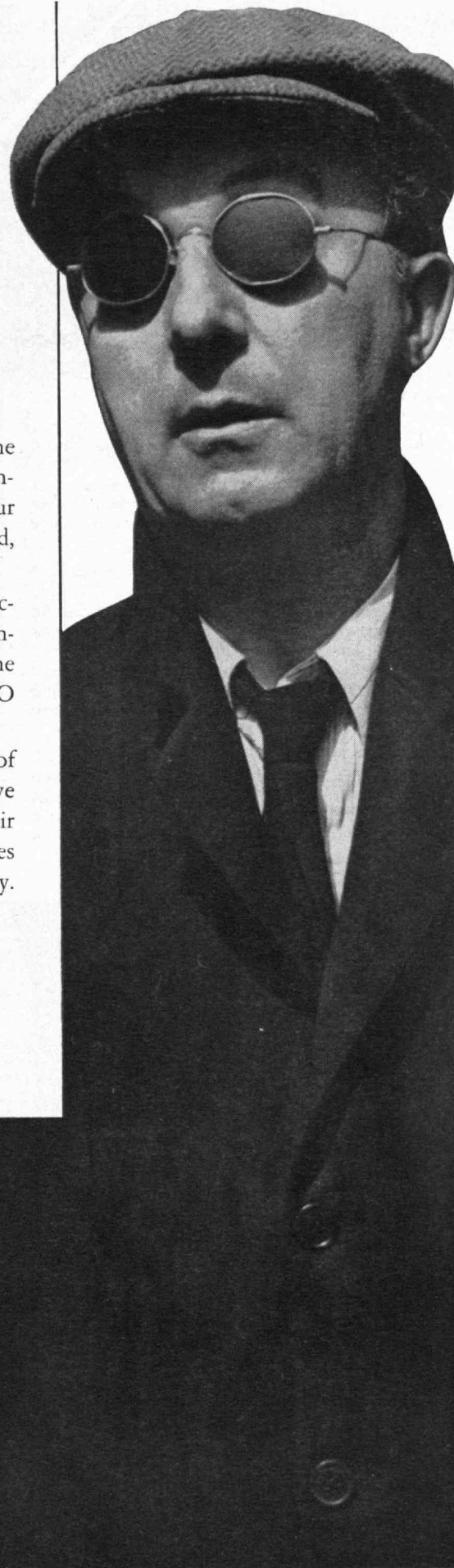
American Optical Company offers you a complete line of scientifically designed, comfortable goggles for every type of eye hazard. Trained AO Safety Representatives give freely of their time and experience to help your Safety Director safeguard eyes and dollars. Get in touch with your nearest AO Branch Office today.

American  Optical

COMPANY

SOUTHBRIDGE, MASSACHUSETTS

Manufacturers for 110 Years of Products to Aid and Protect Vision. Branches in  
All Principal Industrial Centers





PACKED IN DRY ICE  
BLASTED WITH LIVE STEAM

# THIS **NEW** **CHEMICAL STONEWARE** **REFUSES TO CRACK!**

**T**HIS new "Ceratherm 500" will change your whole thinking about chemical stoneware equipment. Here, for the first time in the history of ceramics, is a chemical stoneware body, rugged, like cast iron, of low-porosity and high thermal conductivity, that will withstand abrupt heating and cooling!

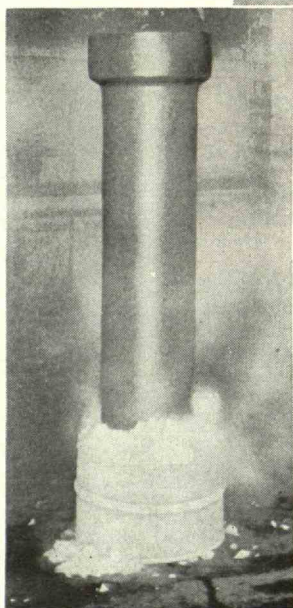
The most persistent claims raised against ordinary chemical stoneware have been its poor resistance to thermal strains and heat shocks, and its fragility. Admittedly tops from the standpoint of corrosion-resistance; admittedly the least expensive material from which equipment of odd size and unusual shape could be fabricated, chemical stoneware would have been specified for hundreds of additional applications if it had been able to withstand rough usage and sharp temperature changes.

"Ceratherm 500", U. S. Stoneware's new heat-shock resistant body does just that. Temperatures can be raised quickly over a wide range through direct application of steam or hot gases, even, in some cases by direct flame. Slow, cumbersome heating with hot oil or sand baths can be forgotten.

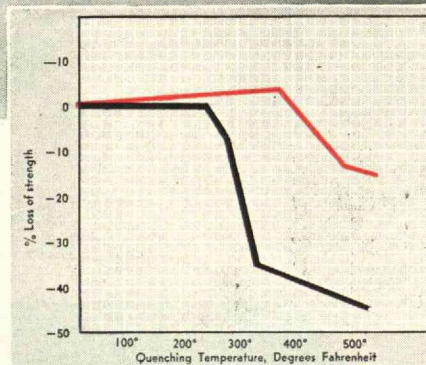
## 27% STRONGER

"Ceratherm 500's" marked resistance to thermal stresses has been obtained without sacrifice of mechanical strength, corrosion-resistance, or absorption characteristics. In fact, "Ceratherm 500" is initially 27% stronger mechanically (it actually increases in strength with thermal changes — see chart) than standard bodies now available. Its corrosion-resistance has been unaffected. Its thermal conductivity is almost 400% greater than ordinary stoneware. Its porosity, as measured by water absorption tests, is less than half the figure generally accepted as being within the limits of good chemical stoneware.

The cost? But a fraction more than standard bodies. In fact, on most items the cost differential is negligible.



*This new "Ceratherm 500" actually shows an increase in mechanical strength (note chart at right) when heated to 400° F. and quenched, more than 100° beyond the point where ordinary chemical stoneware bodies begin to lose strength!*



In the photograph above, a chemical stoneware pipe 10" ID x 5' x 3/4" wall thickness, made from "Ceratherm 500", was packed in dry ice of a temperature of -109° F. After an hour the pipe, still packed in dry ice, was subjected to repeated and prolonged blasts of super-heated steam of 125 lbs. pressure (equivalent to a temperature in excess of 325° F.). An ordinary chemical stoneware body would have been destroyed at the first turn of the steam valve. "Ceratherm 500" was unaffected.



## U. S. STONEWARE

Since 1865 • Akron, Ohio

IN CANADA: CHAMBERLAIN ENGINEERING, LTD., MONTREAL

"Ceratherm 500" is available now. Specify it for full-sized process equipment, such as boiling kettles, evaporating dishes, cooling coils, filters, tanks, mixing equipment, valves, pumps, for any equipment where ruggedness, high thermal conductivity and heat-shock resistance are required.



1943

ARMY

E

NAVY

1918

THE WAR DEPARTMENT OF  
THE UNITED STATES OF AMERICA  
RECOGNIZES IN THIS AWARD FOR DISTINGUISHED SERVICE  
THE LOYALTY ENERGY AND EFFICIENCY IN THE PERFORMANCE  
OF THE WAR WORK BY WHICH

*National Co.*

AIDED MATERIALLY IN OBTAINING VICTORY FOR THE ARMS  
OF THE UNITED STATES OF AMERICA IN THE WAR WITH  
THE IMPERIAL GERMAN GOVERNMENT AND THE IMPERIAL  
AND ROYAL AUSTRO-HUNGARIAN GOVERNMENT

RECEIVED BY THE  
WAR DEPARTMENT OF THE  
UNITED STATES OF AMERICA



APPROVED AND FORWARDED  
BY THE  
COMMISSIONER OF THE  
GENERAL INVESTIGATING BOARD

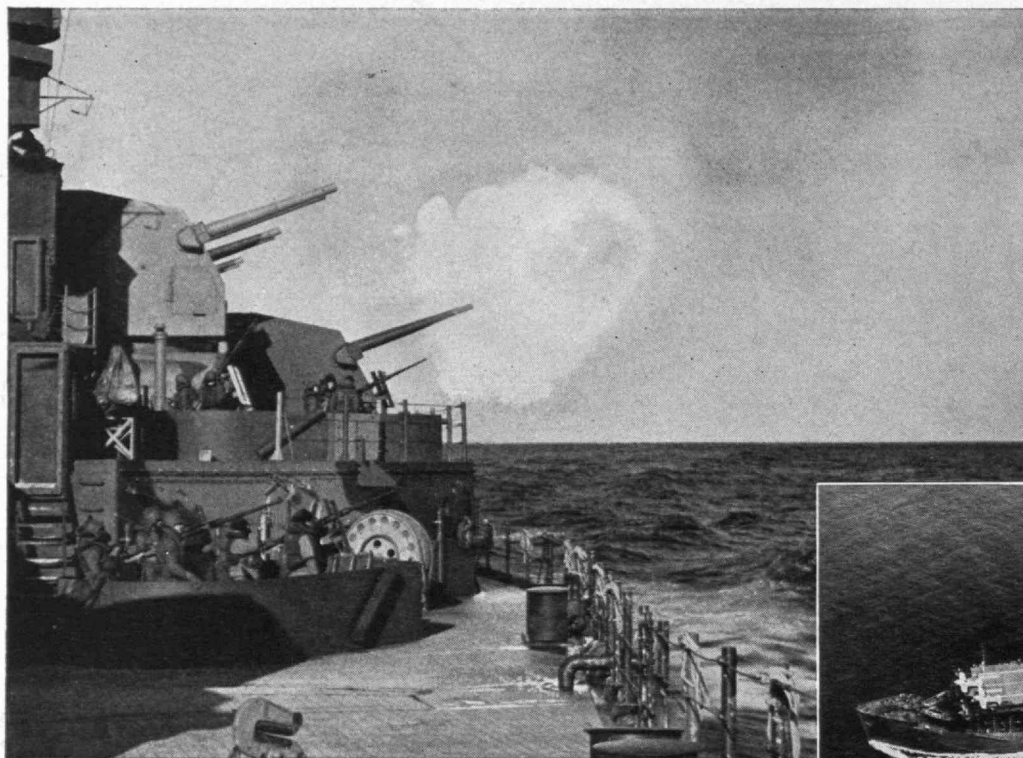
The men and women of National Company take great pride in the reception of the Army-Navy "E" Award for excellence in production. To us it brings a special satisfaction, for twenty-five years ago we received a similar award for service to the Nation in World War I. Old timers have set the pace in winning both awards, but new hands have joined with old skills in putting our difficult job across. It is our pride and our pledge that we of National Company shall keep our record of service bright.



**NATIONAL COMPANY, INC.**

MALDEN, MASS., U. S. A.





OFFICIAL U. S. NAVY PHOTOGRAPHS



## Seeing Pictures Like These

## Makes the Headaches Worthwhile

As with most other plants, Busch-Sulzer found it no easy matter to throw its peacetime procedure by the board overnight and get into a full stride of war production. The Navy wanted ammunition hoists above all and quickly. Men, machines and tools had to start from scratch. New men had to be trained. Obstacle after obstacle had to be overcome.

Sooner than we hoped for, the ammunition hoists began leaving our plant. The Navy wanted Diesels and got them, too. The Department awarded Busch-Sulzer its E—and then a star, a second star and now a third.

Now, these official U. S. Navy photographs

show what the headaches have helped to accomplish. The 'flat top' is the U. S. S. Long Island, an auxiliary aircraft escort vessel of the type that has been much in the news lately. It is powered by Busch-Sulzer Diesels. The other picture shows the 5"/38s of a battleship being fired. These dual-purpose guns are served by ammunition hoists of the type made by Busch-Sulzer. The hoists are made with watch-like precision. Just what they do for the gun is one of those stories that will astonish you after the war.

Right now it's good to know that skilled American workmen have done and are doing their share to hasten the hour of victory.

**BUSCH-SULZER BROS. DIESEL ENGINE COMPANY**

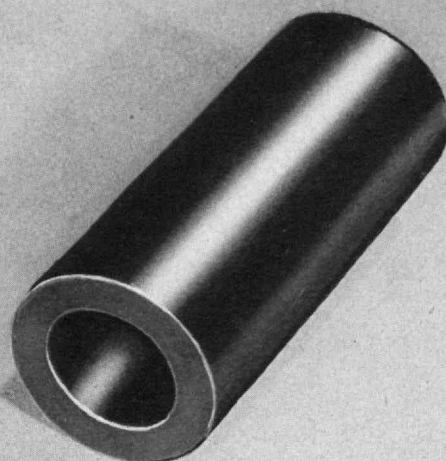
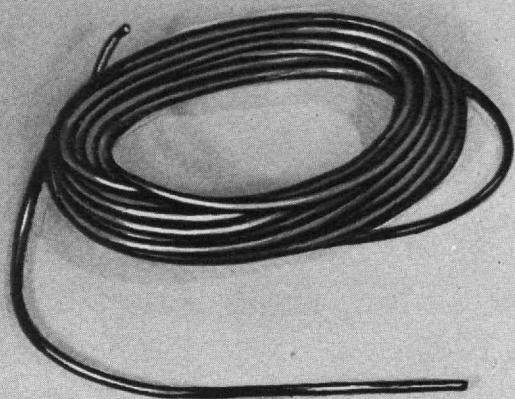
SAINT LOUIS

**BUSCH-  
SULZER**  
ST. LOUIS



AMERICA'S OLDEST BUILDER OF DIESEL ENGINES

from as SMALL as this..



to as BIG as this..

and EVERY Size In Between!

# Sandee

## FLEXIBLE PLASTIC TUBING

Custom-made to every practical size and thickness, the uses for SANDEE Flexible Plastic Tubing are practically unlimited. Investigate this modern product for insulating electrical wire and cable. It's made in all the N.E.M.A. colors. Consider it also for acid drains, oil lines, air hosing, and other such uses. Sandee Plastic Tubing is highly resistant to acids, oils, greases, is non-oxidizing and possesses ample tensile strength. No matter what size, thickness, length, color, or degree of flexibility . . . there's a SANDEE Flexible Plastic Tubing to meet practically every need. Let our skilled plastic engineers help you on production problems. Send for samples and complete information, today. ★ Sandee also manufactures a large line of stock and custom-made extruded *rigid* plastic sections. Complete information on request.

ELMER SZANTAY, M.E. '35, GENERAL MANAGER

# Sandee Manufacturing Company

3945 NORTH WESTERN AVENUE • CHICAGO, ILLINOIS

EXTRUDED PLASTICS AND SPECIAL TOOLS



# "PUT IT ON THE BLANCHARD"

## CHECK THESE ADVANTAGES OF BLANCHARD GRINDING

**Production**

★ **Adaptability**

**Fixture Saving**

**Operation Saving**

**Material Saving**

**Fine Finish**

★ **Flatness**

★ **Close Limits**

..... Especially  
valuable on jobs like  
the one illustrated.

**H**ERE are two surface grinding problems that came to the Blanchard Engineering Department in one week:

- (1) Grind a hardened steel ring  $86\frac{1}{2}$ " in diameter to a tolerance of  $\pm .0002$ " for thickness.
- (2) Grind the edges of a steel strip, .005" thick, .125" wide, and 20" long, straight and to a tolerance of  $\pm .0005$ ".

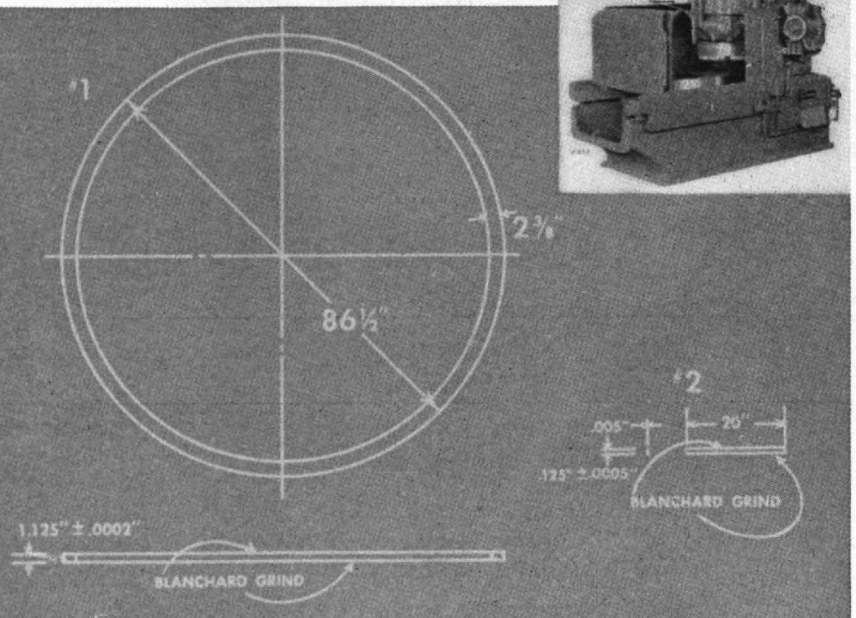
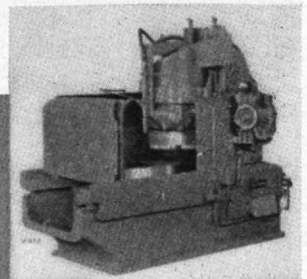
Thirty years' experience in grinding flat surfaces enabled Blanchard Engineers to solve the grinding of both of these jobs, using Blanchard vertical Surface Grinders and Blanchard Grinding Wheels.

If you have work which lies within the range here indicated, you should investigate the possibilities of a Blanchard.

Whether the job is large or small, usual or unusual, Blanchard can show you how to grind it better and faster.

*The* **BLANCHARD**  
**MACHINE COMPANY**  
64 STATE STREET, CAMBRIDGE, MASS.

Grinding Hardened Steel Rings and Edges of Steel Strip on Blanchard Surface Grinders.



Send for your free copy of "Work Done on the Blanchard." This book shows over 100 actual jobs where the Blanchard Principle is earning profits for Blanchard owners.





## The Spark that Lights the Flame of Victory

A pinpoint of fighting metal placed in the arc of the spectrograph writes its own signature on a photographic plate. Inside the instrument, the light from that flame is broken up by a prism as a prism breaks up sunlight. Each element identifies itself by a series of characteristic lines, always the same for the same basic element. It reveals to the spectrographer each constituent, what impurities are present and in what quantities.

Thus spectrography helps in controlling inspection. It keeps tough fighting steels tough, helps in development of

new fighting metals. Spectrography is used too in other fields . . . chemicals, foodstuffs, vitamins. It speeds research, control, and analysis. Today, spectrography is helping to build the tools of Victory as in peacetime it helps to make better cars and better breakfast foods.

Because Bausch & Lomb had long experience with such precision optical equipment needed in education, research, and industry, it was ready for quantity production of precision optical instruments of war such as gunfire control instruments, binoculars, and aerial photographic lenses. When the last gun

is fired, Bausch & Lomb will devote its enlarged experience to peacetime optical production. Through war and peace, Bausch & Lomb has continued . . . and will continue . . . to do the job it knows how to do best. *Here again optical science is seeing it through.*

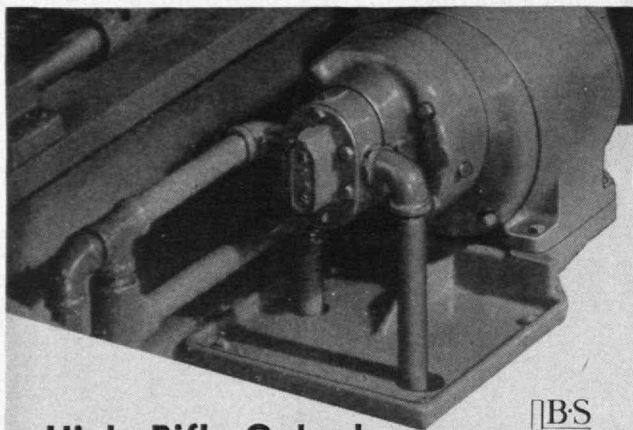
*For Bausch & Lomb Instruments essential to Victory—priorities govern delivery schedules.*

**BAUSCH & LOMB**

OPTICAL CO. • ROCHESTER, N. Y.

ESTABLISHED 1853





## High Rifle Output Depends on Pumps

to maintain uninterrupted hydraulic operation of rifling machines. Brown & Sharpe Motor Driven Rotary Geared Pumps were chosen for this vital war need because of unfailing performance.

Motor Driven Rotary Geared Pumps as well as other Geared, Vane and Centrifugal Pumps, are shown in our pump catalog. Copy forwarded upon request. Brown & Sharpe Mfg. Co., Providence, R. I., U. S. A.

# BROWN & SHARPE PUMPS

## BATH IRON WORKS CORPORATION

*Shipbuilders and  
Engineers*

BATH, MAINE

## THE TABULAR VIEW

**Twoscore.** — It lacked eight days of Christmas in 1903 when Orville Wright started a telegram on the way to his father, reporting a world-shaking event in characteristically unpretentious style: "Success four flights Thursday morning all against twenty-one-mile wind started from level with engine power alone average speed through air thirty-one miles longest 59 seconds inform press home Christmas." This month, 40 years after that windy Thursday on the dunes of Kitty Hawk, The Review presents (page 83) an evaluation of what Orville and Wilbur Wright had to do to bring to pass man's most ancient desire. FRED C. KELLY, one of the members of the press who then paid little heed to the announcement in that telegram, has in the years since worked closely with Dr. Wright on the history of the achievement of 1903. Mr. Kelly's biography, *The Wright Brothers*, authorized by Orville Wright, appeared last spring. His essay in this Review is marked by the trenchant style which makes him a notable companion in contemporary letters. A pictorial footnote of especial interest to Technology people appears on page 93 — a photograph recalling Dr. Wright's attendance at the dedication of the Institute's Cambridge home in 1916, when the *Wright Flyer* was exhibited.

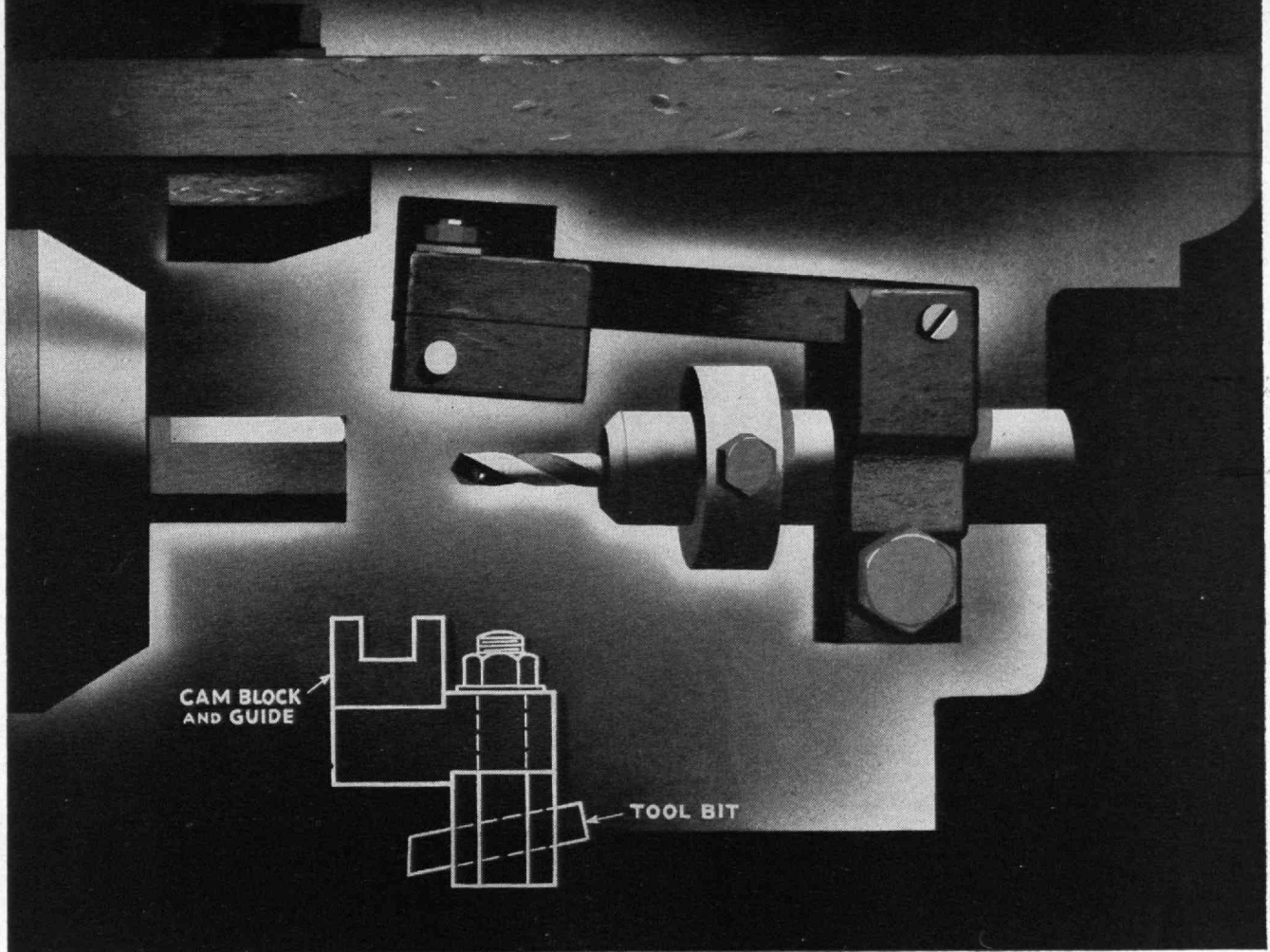
**Team.** — How science, industry, and American military men have worked together for the winning of this war is implicit in all parts of the record of recent years. For The Review, BRIGADIER GENERAL ALDEN H. WAITT, assistant chief for field operations, Chemical Warfare Service, brings an area of that record into sharp focus in an article (page 85) describing the development of a new smoke generator which has proved of great value in the screening of important targets against air attack. An Alumnus of the Institute, Class of 1914, General Waitt is one of the few original World War chemical warfare officers remaining in our Regular Army. He is a frequent contributor to magazines and is the author of *Gas Warfare*, accepted as the standard book in the field.

**Futures.** — It is appropriate that in the anniversary month of the Wrights' success, consideration should be given to our future use of the vast fleets of transport aircraft now in operation for military purposes. L. WELCH POGUE, chairman of the Civil Aeronautics Board, argues cogently (page 88) the necessity for sound planning to meet this problem of the postwar years. An able and farseeing administrator, Mr. Pogue is a graduate of the University of Nebraska; he served as general counsel for the Civil Aeronautics Board before assuming his present post.

**Plant Plans.** — Trends in the construction of industrial buildings, now possibly of academic interest except in so far as large-scale war plants are concerned, will be of major concern to American communities in years to come. They are discussed (page 90) by HERBERT S. SWAN, city planner and industrial consultant, who frequently comments on social phenomena for The Review. Projects for urban rehabilitation which are counted on as assistance in restoring peacetime equilibrium of employment cannot but be influenced by the developments which his article discusses.

**Hot.** — Application of electronic principles to the bonding of plywood is an industrial development of decided importance. THOMAS D. PERRY, who explains (page 80) the technique and its advantages, was graduated from the Institute in 1900, and is sales and development engineer for the Resinous Products and Chemical Company. For some 30 years he has been associated with the development of plywood by American industry and is the author of an authoritative volume on the subject.

## Simple rig saves time on roughing cuts



*Information supplied by an Industrial Publication*

Roughing tools conventionally mounted on turret lathes or hand screw machines have a tough time cutting hex bar stock. Intermittent cutting, accompanied by successive severe shocks make frequent resharpening necessary. This means equally frequent machine shutdowns.

The problem of eliminating the lost time on such jobs has been solved in a New England plant by an ingenious rig applied to some old turret lathes.

The rig consists essentially of two bars. One, carrying the roughing tool, is pivoted to the turret. The other, having a very simple adjustable cam on its lower side, is fastened between the top of the

turret and a sliding support on the headstock.

As the turret advances the roughing tool, the cam feeds it downward, then guides it horizontally and supports it transversely while the roughing cut is made. A drill or other inside tool may be fed in to work simultaneously.

When the roughing cut is finished, the tool is backed off, and the finishing tool fed in on the cross slide. When the roughing tool needs resharpening, it is simply a matter of a few minutes to take it out of the holder and put a sharp tool in. Shutting down is unnecessary. There is less need for expert grinding and resetting.

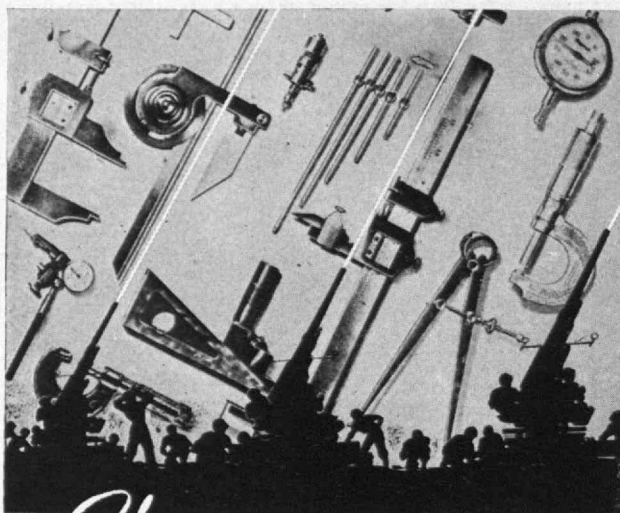
CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.



MOLYBDIC OXIDE, BRIQUETTED OR CANNED • FERROMOLYBDENUM • "CALCIUM MOLYBDATE"

**Climax Molybdenum Company**  
**500 Fifth Avenue • New York City**





## The SAME AIM...

Starrett Tools and the tools of war they're helping to make have many characteristics in common. Both are built for accurate, dependable performance under strenuous service conditions. Both are designed to supplement and sustain the skill and efficiency of their users—to help maintain the morale that hastens victory.



You may continue to put your trust in Starrett Tools.

THE L. S. STARRETT CO., Athol, Massachusetts, U. S. A.  
WORLD'S GREATEST TOOLMAKERS

# STARRETT

PRECISION TOOLS • DIAL INDICATORS • GROUND FLAT STOCK  
HACKSAWS • METAL CUTTING BANDSAWS • STEEL TAPES



## "Peace On Earth"

We are fighting an enemy that has made a mockery of "Peace On Earth." An enemy that lacks, however, the one decisive force for Victory—the inner power that surges within a man when he is defending, with the skill of his workmanship, or the power of his sword, his God-given gift of Freedom!

### DIEFENDORF GEAR CORP.

D. W. Diefendorf '30, President  
SYRACUSE, NEW YORK

# diefendorf

★★★★★ GEARS

## MAIL RETURNS

### Rehabilitation

FROM AMBROSE TERWILLIGER:

The thoughtful paper of Mr. Moholy-Nagy in your magazine for November opens up discussion of a subject which should evoke the careful consideration of all patriotic Americans at once. We have begun already to face the issue, and it will be more forcefully placed before us month by month as this war proceeds: How shall we best discharge the physical debt which every one of us will owe to men who have sacrificed part of their bodily well-being in order to do their part in putting down the brutish aggression which threatened us with the overthrow of principles and institutions that we have historically regarded as basic in human decency?

As a very slight contribution in further extension of your author's excellent proposals, I want to suggest that the very name which we have been in the custom of applying to the means by which we have insufficiently discharged this debt in the past is, to say the least, a very poor one.

You "rehabilitate" cities, maybe, or buildings. It does not seem to me that you rehabilitate men. I find in the term a weak overtone, and I think that it ought to be eliminated. Don't ask me, though, what should take its place. Before addressing you, I combed dictionary and thesaurus, and have to confess that the language here, as in so many other recent technological and scientific situations, falls short of providing an acceptable alternative.

Is this another of the more and more frequently encountered situations which demand that we fly in the face of professors and coin a word to meet a need?

Cambridge, Mass.

## — STEEL —

HOT AND COLD ROLLED  
DEFORMED BARS FOR CONCRETE

## Stahleker Steel Corp.

Second and Binney Sts., Kendall Sq., Cambridge, Mass.

Telephone Trowbridge 1440

WALLACE BLANCHARD, '16, Treasurer

Speed with  
Economy



Air Reduction Sales Co.  
(Alteration and Rehabilitation)

After the war, in converting plants to peacetime products, there will undoubtedly be quite a demand for alteration and reconstruction. . . . You will find that we can offer you valuable suggestions on such projects—based on long experience.

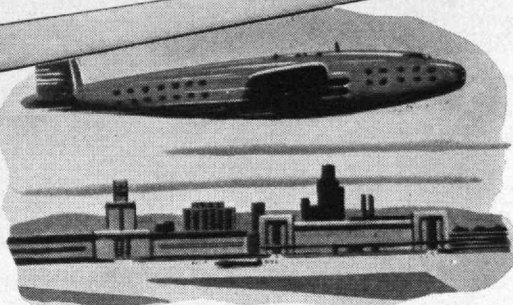
### W. J. BARNEY CORPORATION

101 PARK AVENUE, NEW YORK

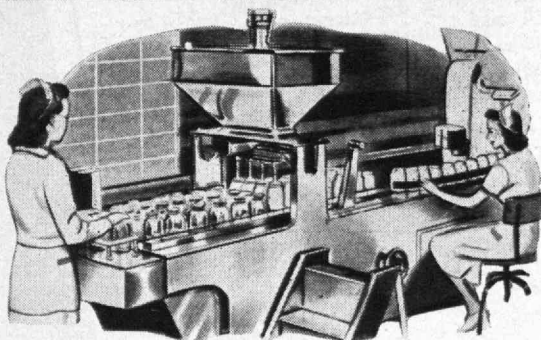
INDUSTRIAL CONSTRUCTION

Alfred T. Glasett, '20, Vice President

# Filling Prescriptions with Steel!



**1. BETTER STEELS!** This country needs aircraft that fly high and far . . . and hit hard. It needs ships in great numbers. It needs tanks that can take it when the going gets tough. It needs equipment to outperform any on earth. All these things require many special steels. Such steels with needed properties are created through the use of *alloys*. Basic peacetime research by ELECTRO METALLURGICAL COMPANY, a Unit of UCC, has developed many important steels and the alloys to make them, such as chromium, silicon, manganese, vanadium, tungsten, calcium, and columbium . . . all vital today.



**2. STAINLESS STEELS!** The development of steels of high chromium content gave designers and engineers a whole family of new materials with which to work. Such steels resist rust and corrosion, and are easily kept clean. They are essential in the food industry. Possessing great strength in addition to their corrosion resistance, they save weight in trains and planes. They have brought improvements in the oil, chemical, textile, and other fields . . . with resultant savings to you. Low-carbon ferro-chromium, an Electromet development, is essential in the large-scale production of stainless steels.



**3. NEW NATIONAL RESOURCES!** Tungsten and vanadium are essential to steelmakers. Long before war clouds loomed, many felt that more of this country's domestic sources of these metals should be developed. Engineering research by UNITED STATES VANADIUM CORPORATION, another UCC Unit, found efficient ways of refining low-grade ores. This enabled U. S. VANADIUM to revitalize old mines with new mills and methods, and make America less dependent on foreign sources for her increased needs of tungsten and vanadium.




**4. BUILDING TOWARDS THE FUTURE!** Alloy steels offer still greater promise for the future. Bridges and other structures will be made still lighter, stronger, and longer-lasting by wider use of some of the steels with which engineers are already experienced. Trains, trucks, and aircraft will be made lighter, stronger, faster, and safer. Better cars and tractors, homes and home equipment will be made through their use.

*Units of UCC do not make steel. They do make ferro-alloys used to purify and give special properties to steel. They also make non-ferrous alloys which, because of their exceptional resistance to wear, heat, and corrosion, are used as cutting tools, hard-facing welding rods, and for other purposes. UCC research and developments mean ever-new and improved alloys for industry . . . and ever-better products for you.*

**BUY UNITED STATES WAR BONDS AND STAMPS**

## UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street  New York 17, N. Y.

*Principal Products and Units in the United States*

### ALLOYS AND METALS

Electro Metallurgical Company  
Haynes Stellite Company  
United States Vanadium Corporation

### CHEMICALS

Carbide and Carbon Chemicals Corporation  
**ELECTRODES, CARBONS AND BATTERIES**  
National Carbon Company, Inc.

### INDUSTRIAL GASES AND CARBIDE

The Linde Air Products Company  
The Oxweld Railroad Service Company  
The Prest-O-Lite Company, Inc.

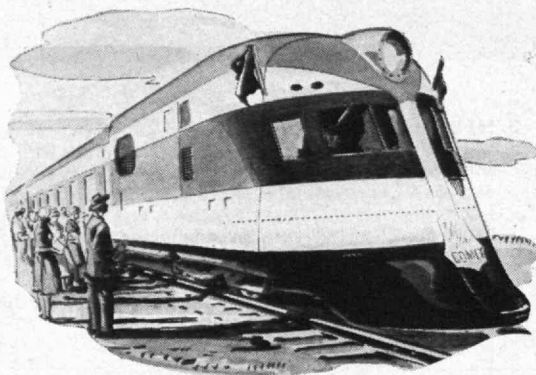
### PLASTICS

Bakelite Corporation  
Plastics Division of Carbide and Carbon  
Chemicals Corporation



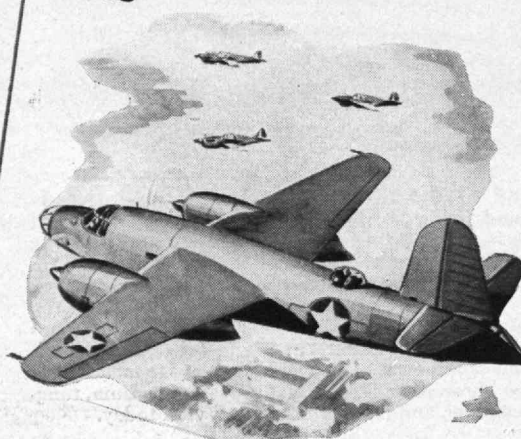
# Trail Blazing in the Skies

1935



**FIRST STREAMLINER BUILT ON AERONAUTICAL PRINCIPLES** was the famous "Comet," designed and fabricated by Goodyear's Aircraft division in 1935 for the New York, New Haven & Hartford Railroad. In the Comet, lightness-with-strength was achieved by designing roof, sides and floor of the cars as main load-carrying elements of the structure — the same stressed-skin or monocoque construction widely used in aircraft. This undertaking was part of Goodyear's early work in exploring the possibilities of light aircraft metals that contributed to the development of the superior alloys in use today.

1943



**METALCRAFTING EXPERIENCE THAT STREAMLINES MANY PRODUCTION PROBLEMS.** As a result of its long experience in aeronautical design and light-metal fabrication, Goodyear is today one of the largest producers of subassemblies for all types of aircraft. These include complete empennages and wing panel assemblies, and all their component parts, cabin structures, floats, and float mechanisms — for both "hot" fighters and heavy bombers. And in addition Goodyear is one of the producers of the Corsair — a fact that bespeaks Goodyear's ability to handle complete and intricate production problems on a large scale.

## HOW GOODYEAR AIRCRAFT CORPORATION SERVES THE AIRCRAFT INDUSTRY

1. By constructing subassemblies to manufacturers' specifications.
2. By designing parts for all types of airplanes.
3. By re-engineering parts for mass production.
4. By extending our research facilities to aid the solution of any design or engineering problem.
5. By building complete airplanes and airships.

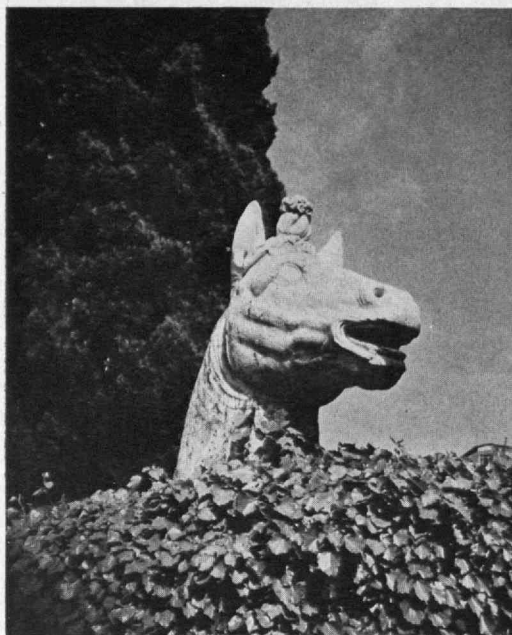


# THE TECHNOLOGY REVIEW

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Benjamin W. Irwin, Jr., '33

A horselaugh from a museum garden in Rome

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From a photograph by Fritz Goro from Black Star

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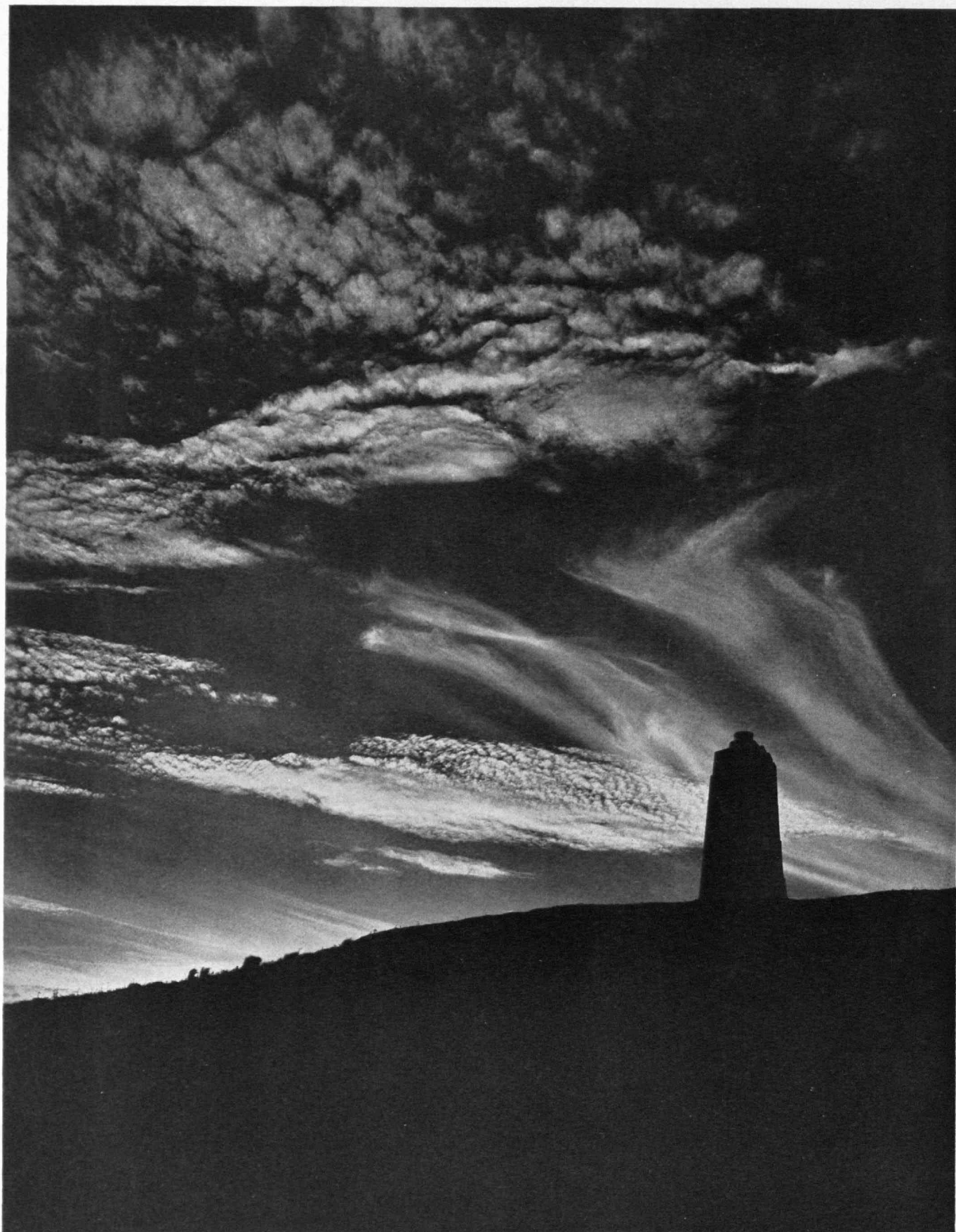
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### ON KILL DEVIL HILL

*The Wright Memorial is silhouetted broodingly against the evening sky  
near where sustained flight in a heavier-than-air machine  
was achieved on December 17, 1903.*

# THE TECHNOLOGY REVIEW

Vol. 46, No. 2



December, 1943

## The Trend of Affairs

### *Deus ex Machina*

IN building up his arguments for the theory of evolution, Darwin felt it necessary to explain how species may spread over the earth, often across natural barriers which at first thought would appear insurmountable by the particular plant or animal. Slow climatic changes might permit the gradual spread of a species, seeds might lodge on the beaks or talons or in the intestines of birds and be transported to new continents and islands, burs might stick in the fur of animals, a fruit with a specially impervious covering might float for great distances in ocean currents and finally, after perhaps millions of tries, one of them might find a suitable lodging place, and so on. Nevertheless, only a comparative handful of species have the mechanism or the endurance to permit much traveling. It is an incident worthy of note when even a whale, positively marked in one ocean, is picked up in another. The great barriers of temperature, oceans, deserts, mountain ranges, and many other comparable conditions have succeeded in restricting most important geographical regions to their own typical flora and fauna. In spite of much mingling and merging, few areas of any extent are found to be without plants, animals, or insects peculiar to them.

Thus, for many aeons the mosquito *Anopheles gambiae* gave the dubious distinction of its presence to tropical Africa alone. Less than 2,000 miles away to the west lay the equally salubrious (for the mosquito) jungles of the Amazon basin, but no natural means were available to give the mosquito passage. Then, in 1930, the French republic being desirous of establishing an air route between its African possessions and Brazil, various of its planes and destroyers began traveling back and forth between Dakar and Natal. By one of these means this particularly dangerous mosquito reached Brazil, where its further progress was marked by outbreaks of a severe form of malaria against which science was successfully marshaled by the Rockefeller Foundation.

The brotherly sharing of diseases and pests has long been a feature of man's movements over the planet. Undoubtedly smallpox, tuberculosis, pneumonia, scarlet fever, and measles (all unexpectedly fatal to peoples not immunized by long association) had a far greater part than warfare in clearing America for European settlers, just as such diseases have ravaged the native populations of tropic regions and, as far as that goes, just as tropical diseases have been and are being brought into temperate zones. Here, luckily, the climate is a great aid in disposing of them. Ships have brought to this country the Hessian fly (one of the earliest problems to trouble our oldest scientific organization, the American Philosophical Society), the Japanese beetle, and the Dutch elm disease, just as they have carried American pests abroad.

These are typical of unpremeditated exchanges, but in so far as man has played the role of *deus ex machina* to various bacteria, plants, and insects, he has done it not merely by chance but by design. Darwin could have logically insisted that a 50,000-horsepower destroyer carrying a mosquito is in the same class with a tern carrying a grass seed. What is to be said, however, for the deliberate transplanting of plants and animals to new regions in the hope of some benefit? Here man is truly the god of the machine to nature, stepping in when it pleases him to solve difficulties in transportation far beyond the possibilities of natural mechanisms.

Consider the banana. Presumed to have originated in the humid, tropical regions of southeastern Asia, it was carried from there to the islands of the Pacific by successive migrations. In the other direction, it was carried to Africa from India by Arab traders who then transplanted it, step by step, as they marched westward across the Dark Continent in search of slaves and ivory. The Portuguese found it on the west coast of Africa, and carried it to the Canary Islands and from there to the New World.

Or consider the potato. The Spaniards found it in the highlands of Peru. Peruvians still depend heavily on the potato as a food staple; in fact, they have been importers





National Film Board from Black Star

*On its way to become aircraft plywood, this Sitka spruce is opened up by two braunny fallers — part of the crew of Canadian lumberjacks who this year got out 200,000,000 feet of spruce on the Queen Charlotte Islands, 50 miles from Alaska.*

in recent years, but by far the world's largest producer is Russia. The potato traveled from South America to Spain in the Sixteenth Century. When in the Seventeenth Century the Spaniards attained control of Flanders, they introduced the potato there. Thence it went to Germany. From North America it traveled to Britain and Ireland. By the time the industrial revolution was well under way, the potato — which is among the highest producers of calories per acre of any food growable in cool climates — was sufficiently well established in Europe to help feed her rapidly increasing populations.

Such stories can be repeated more or less ad infinitum. The rubber tree, native of the rain forests of South America, now flourishes over great areas of the East Indies and the Malay Peninsula. Quinine from the cinchona tree, which is a native of the Andes, is (or was) obtained mostly from the East Indies. We have imported the soybean from Asia, many varieties of livestock from Europe, fish from all over the world. The Pacific salmon, after extensive trials in many apparently suitable regions, has finally taken hold in a few streams in New Zealand and southern Chile. American cigarettes are now flavored with many tobaccos grown in regions which had never heard of the weed until well after Sir Walter Raleigh lost his head. Latakia from Syria is an example.

It will be recalled that when the gods descended from Mount Olympus to meddle in men's affairs, the results not infrequently were disastrous either to the recipients of their favors or to the more or less innocent bystanders. Man's tinkering with nature's balance doesn't always turn out so well either, as Australia spectacularly illustrates.

Under a sudden influx of competition-toughened plants and animals from Europe and the Americas, that continent acted like an ecological vacuum. Wheat and wool, which produce much of Australia's wealth, are not native products, and many another importation has lived up to expectations. But on the other hand, the descendants of the domestic pigs which Captain Cook introduced into northeastern Australia with the most praiseworthy motives are now referred to as "Cook's curse," for they have pretty well devastated many sections between Cape York and Burketown. The prickly pear, which was imported to form hedges and act as fodder, forced out all useful vegetation over scores of millions of acres and was brought under control only by the most strenuous efforts. And, of course, the rabbit, which was brought in to give a little sport now and then, has practically taken over the country, influencing the pattern of Australian agriculture and even assuming geological significance, for so thoroughly has it destroyed vegetation in many arid regions that the topsoil has been loosened to become the prey of wind and water. As in some parts of the United States, the deserts are on the march in Australia, their way paved in part by the rabbit.

## Electricity for Plywood

By THOMAS D. PERRY

MANY of the improvements in the technique of making plywood have appeared from unexpected sources. For instance, the epoch-making resin adhesives did not come from gluemakers but were originated by a chemical manufacturer without background in either glue or woodwork. The process of molding plywood with flexible bags and fluid pressure originated in the rubber-tire industry, where outer casings were vulcanized under internal pressure. This molded, or *monocoque*, plywood has been of outstanding utility in the aircraft and boat program. Resin impregnation and compression followed the pioneer work in wood preservatives.

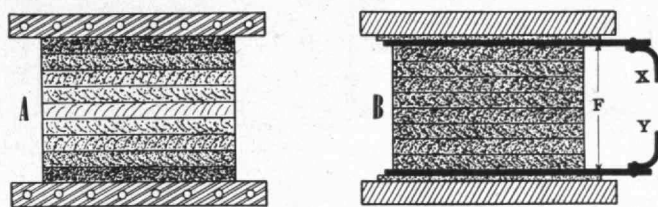
Another important contribution to plywood technique has now crossed the threshold, and this one came from the radio industry. Diathermy apparatus, the artificial fever machine which heats interior human tissues without burning the skin, is well recognized by the medical profession. Diathermy's counterpart, radio-frequency heat, is fast becoming an important heat source in industry. In the metal field, heating by induction at radio frequencies has been adapted to welding, tempering, annealing, and the like. In woodworking, radio-frequency heat gives distinct promise in the rapid heat-curing of the recently developed resin adhesives. Up to now there has not been a satisfactory method of heat application which would penetrate a thick wood block, through and through, both rapidly and uniformly.

In order to visualize the value of such an instrumentality as radio-frequency heat, a brief outline of the development of the new resin adhesives that are revolutionizing the plywood industry may be helpful. The older, conventional glues obtained their "set" chiefly by the rather slow evaporation of the solvent, and most of them were more or less resolvable when exposed to extreme moisture. The resin adhesives, on the other hand, are hardened by chemical action, usually activated by heat, although some types can be cured by chemical action alone. Resin joints

are highly resistant to water and are more durable than those obtained with any of the earlier glues. Experience has demonstrated that of the various types of resin adhesives, the hot-pressed phenol-formaldehyde resins give the most durable bond. For several years this type of resin bond has been required for Army and Navy aircraft. The best of such phenolic adhesive joints can be fully cured in five minutes by application of a temperature of approximately 300 degrees F. Lower temperatures prolong the time requirements, reduce the output, and may lower the moisture resistance of the bond by inadequate cure. Urea-formaldehyde resin adhesives have lower temperature requirements; with proper catalysts, they can be cured at 75 degrees F. Though the process is slow, it can be accelerated by heat. Urea resin bonds are less resistant to heat and moisture than are phenolics, though heat cures tend to increase their durability. These comments on resin adhesives add up to the fact that a hot-pressed phenolic resin bond which is cured at around 300 degrees F. gives the most durable glue bond for use in exacting service.

It is this fact regarding the optimum conditions of obtaining durability in resin adhesives which makes the consideration of radio-frequency heat so worth while. If the plywood is thin, up to a quarter of an inch thick, heat can easily be applied on the outside; penetration of the heat, while progressive, is reasonably fast, and the moisture balance between the surface and the interior of the plywood is not seriously disturbed. Hot-plate presses with steam-heated platens give satisfactory resin cures in plywood up to a thickness of about an inch, but the moisture unbalance becomes more serious as the thickness increases. When plywood is over an inch thick, the difficulties resulting from the application of external heat become rather complicated and the progressive variations in heat, moisture content, degree of cure, and compressibility are not likely to produce a reliable and uniform product.

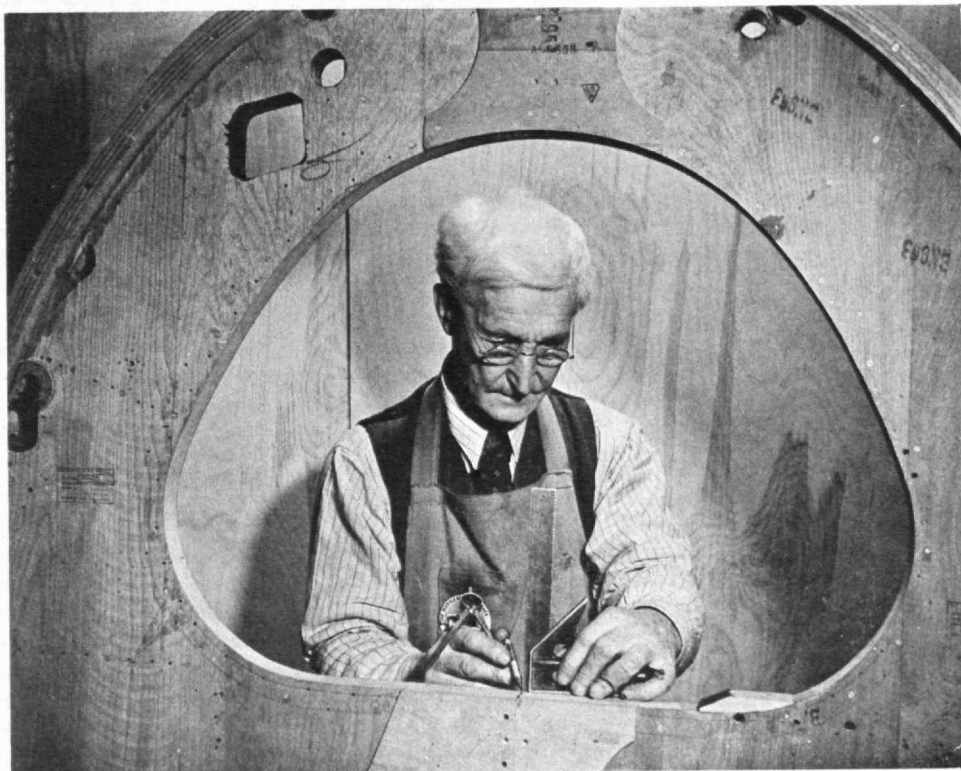
A contrasting example is that of a wood assembly several inches thick, placed between electrode plates of a high-frequency field. With equipment of a suitable capacity, the temperature throughout the wood assembly is found to be amazingly uniform and to give a prompt heat cure to the adhesive bond between the layers. The speed of heat increase is dependent on the electric power available, and a proper control of variations in density and moisture content is desirable. The results that can be obtained with such heat effects in glued assemblies using synthetic resin adhesives are outstanding. Blocks 12 or more inches thick can be heated thoroughly and the adhesives cured in no longer than is required for quarter-inch plywood between steam-heated platens. The contrast in heat distribution between the two methods is shown in Figs. A and B. The former represents steam-heated plat-



ens and the latter a pair of electrodes producing a radio-frequency field. Two highly important industrial applications of such thick glued members are to the fabricating of heavy keels and ribs for ships and to the bonding of multiple wood laminations into heavy timbers for trusses, arches, beams, and so on, in bridges and roofs. Without rapid heat penetration, the most effective bonding is difficult to secure. Both of these industries bid fair to be large consumers of resin adhesives in the postwar years.

As has been noted, some resin adhesives can be cured at normal temperatures of 75 degrees F., but at such temperatures many hours of clamping are required, output is seriously retarded, and the amount of clamping equipment needed is greatly increased. With any given type of

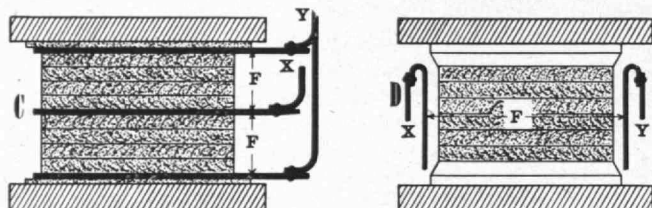
*Cut into veneers which are bonded into plywood, airplane spruce reaches its destiny in forms such as this, which will become part of a Mosquito bomber.*





resin, heat-cured bonds are generally more durable than those produced by the chemical reaction of catalysts, and the most durable types of resin adhesives have not yet been found to cure satisfactorily without the application of substantial heat.

The high-frequency field for such adhesive work is generated by equipment of the order of a small broadcasting outfit. Except for the larger units, which require a stationary installation, the equipment can generally be moved around the factory from job to job. The frequency of the electric field is usually between two and ten megacycles, although in some special cases still higher frequencies are used. Two methods of positioning the electrodes are shown in Figs. C and D. Wood assemblies may



also be clamped with metal strips, or plates, on both sides and next to the forms, or molds. Such thin plates are adapted to curved laminated assemblies. They serve as electrodes and have projecting terminals to which the high-frequency generator may be attached. With a series of such clamps, the movable generator can progress up the line without loss of operating time.

So far we have been concerned only with adhesive bonds between layers of wood or veneer. The use of heat produced by a radio-frequency electric field also serves an important function in wood assembly operations when a plywood covering, or skin, is to be affixed to ribs or spars as in an airplane wing, or when plywood is to be attached to the framework of houses or industrial structures. Here the electrodes may be of various shapes and at such location as to permit the current to pass through the glue line. Sometimes the two electrodes may be in a hand tool and applied to the outside of a thin plywood skin. The surrounding electric field is extensive enough to heat a glue line just on the inside of the plywood. In assembly joints the speed of setting is of prime importance in facilitating production and reducing clamping equipment. There again such electrostatic "spot welders" can be used to tack layers of molded plywood together temporarily.

All in all, radio-frequency heat offers a wide range of utility to the woodworker, and new discoveries are constantly widening its utility. Whether it is the all-purpose method of curing resin bonds is still a question, and how far it may be useful in a supplementary way to steam and electric-resistance heat remains for a later entry in the ledgers of industrial progress.

### Science at War

THAT the war now racking the world is a war of science has been said so often as to need no repetition. The phrase is one of those inclusive categoricals which are so convenient and so inclusive as to be decidedly dangerous both to the statement they purport to make and to the terms in which they seek to make it. For this reason, George W. Gray's excellent *Science at War*\* commands special commendation because of the fact that it estab-

lishes clearly the distinctions necessary to general recognition of the truth that though in this war as in all wars science is an arsenal of mighty weapons, though scientists now are arming the fighting man more powerfully than ever before, though war can be shown always to have been a great stimulant to research and effective employment of the results of research, the business of science nevertheless is not war. Mr. Gray tilts at no windmills, but he does both from the record of the past and from his temperate analysis of the present demonstrate succinctly that though science may be at war and should be at war, science is not intrinsically of war but rather is of peace and will in the decades after this war become a more vigorous thing of peace than it has had opportunity to be during its comparatively short course as a factor in human affairs.

Running the gamut from the Germans' magnetic mine, which was the first of the "secret weapons" of this conflict, to the developments in aeromedicine which promise to be among the most lasting of the secrets which it has revealed, Mr. Gray's book is necessarily packed with detail. To present such a mass of material only after the accuracy and authority of the myriad items had been established is no small accomplishment. To arrange and pattern the mass into coherent and easily assimilated order is perhaps an equal one. *Science at War* is in both these regards new evidence of its author's well-merited reputation as a reliable and skillful writer.

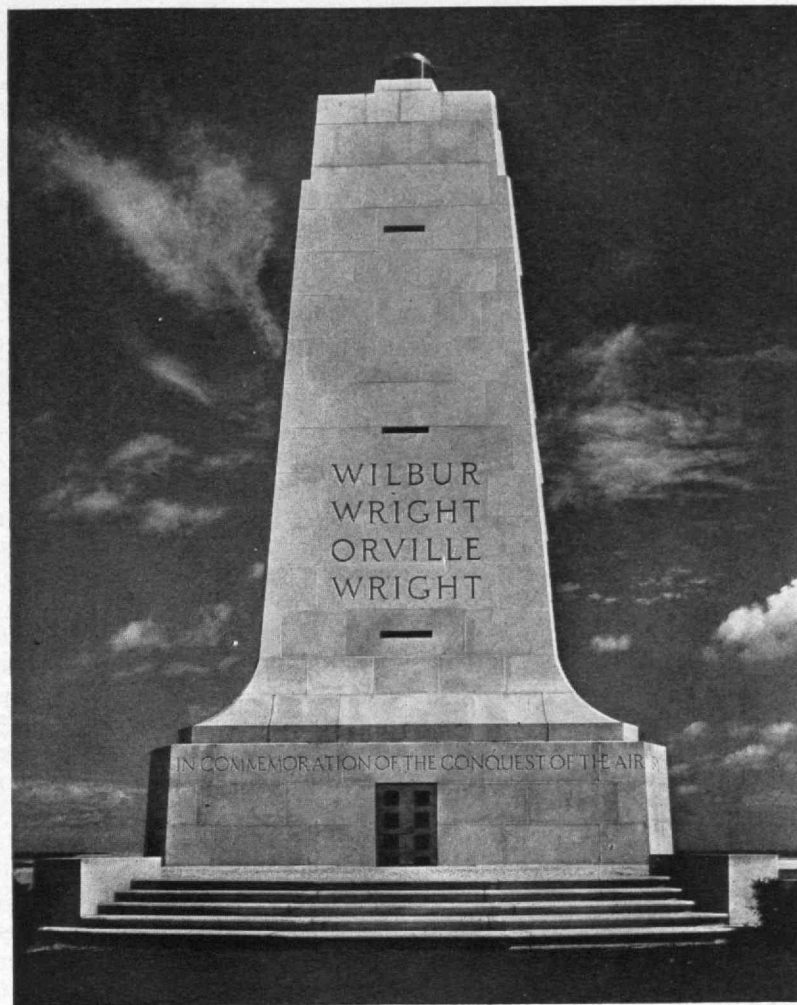
Of particular interest as they provide bases for suggestive speculation over the future are chapters dealing with mathematics as it has been applied in the war, with the development of new materials and of new techniques of using older materials, with war medicine and war surgery as apart from aeromedicine, and with the uses of psychological methods in the war of ideas. Readers of *The Review* who recall, in our issue for July, Mr. Gray's article discussing the military utilization of applied mathematics will find interest in the expanding of the story in this volume. Best counterbalance to the gloomy story of distortion and falsehood making up the technique of the war of ideas as Goebbels practices it is the recital of the arraying of medical and research skill which thus far in this war has given better than a promise of reducing the toll of death and disablement to a lower mark than has ever before been possible. Aeromedicine, with its studies of oxygen starvation, of the physiology of acceleration, and of the psychological effects of the nervous tension of flight, is obviously a discipline of tremendous importance for the future. The flying ambulance as a concrete physical thing is a vivid example of a new instrumentality in medicine; less immediately dramatic but of possibilities which presage influence in ways as yet undreamed are the new-found ideas, theories, and quanta of abstract knowledge of which this field is compact.

### Progress Report

AMONG the characteristic events of the chaotic year which draws toward its close this month was the minor terrestrial cataclysm which attended the birth of a volcano in the Mexican state of Michoacán. Overshadowed in the news by social and spiritual upheavals of far more titanic force, the fiery cone of Parícutin has nevertheless since its emergence pegged steadily away at the job of being a model of efficient vulcanism according to classical standards.

(Concluded on page 114)

\* New York: Harper and Brothers, 1943. xi + 296 pages. \$3.00.



F. S. Lincoln, '22

# The Revolution at Kitty Hawk

*What the Achievement of the Airplane Owed to the Past  
and Presages for the Future*

BY FRED C. KELLY

TODAY, 40 years after the achievement of sustained flight in a heavier-than-air machine, we know that unless we can organize the world to maintain peace, civilization may be destroyed. We hear that right now it is possible to build bombers capable of making nonstop round trips between Europe and America. Passenger trips to Europe between breakfast and dinner have become commonplace. If the airplane has created great danger to everyone in the world, it also has made evident the fact that somehow we *must* prevent future wars. We've somehow *got* to succeed — because the airplane leaves us no choice between world unity and chaos. Whatever happens, the airplane has already had a more revolutionary effect on world outlook than any other thing since the discovery of America.

Regarded from the purely technical side, without reference to its effects, the airplane

may be considered revolutionary in another way — from the manner in which it was invented, from the fact that it required fundamental discoveries. It was almost as if Orville and Wilbur Wright had started from scratch when they began the endeavor which reached successful consummation over the dunes of Kitty Hawk on December 17, 1903.

Nearly every great invention is largely a synthesis of principles already known. But that was not true of the airplane. Though many able men, including eminent scientists, had tried to design machines that could fly, and a vast amount of money had been spent in such attempts, the Wrights received surprisingly little technical help from the work of any of their predecessors. True, they did get *inspiration* from others, and they doubtless avoided much waste effort by learning what had come of earlier attempts

Above:  
*The Wright  
Memorial on  
the dunes near  
Kitty Hawk,  
North Carolina*



to fly. They came to have great respect for their predecessors, even for those who had made dismal failures, for no one knew better than the Wrights how great were the difficulties. They felt deferential toward all who had thought it worth while to try and to risk their lives in testing their theories. But the Wrights soon came to recognize which of their predecessors had been truly important.

Their greatest debt of all was to Otto Lilienthal, who had made gliding experiments from a hill artificially created for that purpose near Berlin. Reports which they read of Lilienthal's gliding first caused the Wrights to become seriously interested in human flight. Except for Lilienthal's experiments and what he wrote about them, it is doubtful whether the Wrights would ever have undertaken a serious study of flying. Lilienthal was the first of all the experimenters to have any understanding of why a cambered wing was more effective than a flat one — though many before him had *proposed* the use of cambered wings, simply because birds had them.

Even though it was Lilienthal who got the Wrights interested in trying to fly — and they freely acknowledged that their debt to him was great — yet in their first powered plane they used no technical device or data taken from Lilienthal. His tables of air pressures on curved surfaces had proved to be inaccurate. Not until after they had made their own compilations of air pressures, from wind-tunnel experiments, were the Wrights able to build the 1902 glider in which they virtually solved the problem of equilibrium. Both the shape of the wings in that machine and the method of control were conceived by the Wrights and by no one else.

The fact that the Wrights did not use much technical knowledge discovered by their predecessors seems to be contrary to a widespread impression. Since my biography of the Wrights appeared, I have had numerous letters from readers who evidently had thought that all the Wrights did was simply to go a little farther, in the same direction, than others had succeeded in doing. One letter — from a science editor — argued that I should have given more credit to Samuel P. Langley, onetime Secretary of the Smithsonian Institution, who had made costly attempts to build a successful flying machine. The Wrights did receive inspiration from Langley, and have publicly said so. It was encouraging to them to know that a great scientist, the directing head of a famous scientific institution, considered human flight possible. Beyond inspiration and encouragement, however, the Wrights got nothing from Langley. His scientific work itself was of no value to them. Published reports of his studies of air pressures dealt with flat surfaces only, and even those figures were inaccurate. No technical idea embodied in the Wright machine came from Langley. (It may be added that in no other successful airplane has any scientific idea original with Langley been used.)

One of the earlier experimenters whom the Wrights, from their reading, recognized as a man of great ability was Sir George Cayley. Early in the Nineteenth Century, he had formulated tables of air pressures and a system of control. His measurements of air pressures were made on flat surfaces only, and the Wrights made no use of them. But it was a source of satisfaction to the brothers to know that a man of Cayley's high standing had not considered it "crazy" to study the possibility of human flight.

Another early experimenter with whose work the Wrights were familiar was William Samuel Henson. He

and another Englishman, John Stringfellow, built a model plane reported to have been flown in 1848. Although both of those men showed mechanical ingenuity, the importance of their work is sometimes much exaggerated. I have seen a statement, in a letter from a writer on scientific subjects, that "Henson had conceived about everything the Wrights had, except the important twisting wing tips. Launching, propulsion, sustentation, steering, and control — all were pretty much anticipations of the Wrights." Such a statement is nonsense. The truth is that the most Henson contributed to the flying art was the structural design of his wing ribs, which had an upper and lower strip of wood fastened together at the front and rear ends, with blocks between them at intermediate points. In that way he got a light rib of considerable thickness and stiffness, with sharp front and rear edges. To obtain the desired thickness and stiffness at the center, Henson built his wings with a slight curvature, or camber, but not because of any knowledge that cambered wings were more efficient than flat ones. Evidence can be produced to show that Henson was unaware of the aerodynamic value of camber. His knowledge of aerodynamics was only what he got from Cayley, and Cayley considered plane and cambered wings equally good (*Nicholson's Journal*, November, 1809). Stringfellow likewise lacked knowledge of the value of the cambered wing. A proof is the fact that in his last model (his triplane of 1868) he used flat wings.

Henson's rudder — as his patent states — was for the purpose of steering. The rudder on the Wright machine, however, was for lateral balance. (Adding a rudder to a flying machine to steer it, as does the rudder of a boat, would not constitute invention unless by such means a new effect was produced. The rudder in the Wright machine was patentable because it did create a new effect, not produced by a ship's rudder. In the oral decision of the Supreme Court of Germany, in a Wright patent suit, the chief justice said the Wrights would have been entitled to a patent for the rudder of an airplane, even if the plane had no ailerons, had they applied for such a patent, because all parties to the suit admitted that the airplane rudder was a balancing device, not a steering device, and that the Wrights were the first to discover it as such.) Henson did not provide any means for maintaining the lateral balance of his machine, not even the dihedral known to Cayley. He knew nothing of the function of the airplane rudder of today.

Clever as was the work of those early builders of model airplanes, it should be made clear for the historical record that they were a long way from accomplishing the miracle of human flight. Those flying models were wonderfully ingenious toys and they gave both inspiration and hope, but they by no means proved that it was possible to build a machine that could fly and carry a pilot. A 10-year-old boy can build a small Pénau helicopter and fly it, with no power except that of a twisted rubber band; the best engineers cannot follow the same design, on a scale large enough to lift a man, and make the machine fly.

There is no gainsaying that in their machine the Wrights used devices that were already well known. For example, they adopted superposed surfaces, which had been used by Wenham and later experimenters. (Indeed, the principle had been proposed long before Wenham's time by a minister of the gospel, the Rev. E. J. Corder, and it had been used in Chinese (*Concluded on page 96*))

# Smoke, but No Fire

## *How Science, Industry, and the Army Co-operated to Develop a Notable Method for Smoke-screening Targets*

BY ALDEN H. WAITT

AIRPLANE factories, munition works, power stations, railway centers, bridges, and similar installations are important and legitimate targets for long-range bombardment airplanes. Antiaircraft artillery defense has progressed to such an extent that, in order to prevent excessive losses, attacks on such objectives are generally made at night or at extremely high altitudes. On moonlight nights, however, trained bombardiers can hit such targets even when they are blacked out, and with the aid of flares can locate them when there is no moon. Smoke has been used by all the combatants in this war to prevent aerial observers from picking out these targets. Unless lights are showing on the ground, the smoke need not obscure completely. It is effective if it scatters or absorbs enough of the reflected light of the moon or flares to make ground features unrecognizable.

One of the most widely used methods for producing the extensive smoke screens required to protect vital points in areas back of the front has been the partial burning and distillation of low-grade fuel oil in smoke generators similar to the orchard heaters and smudgepots used in California fruit groves. These oil smokepots produce a dark gray smoke which is effective but expensive in men and material. When they are in use, the smokepots must be serviced frequently, almost every hour throughout the night; operating them requires many men; and they provide little or no protection if used during the day. There are other methods for making smoke, each having advantages and disadvantages, but all falling far short of screening requirements for large areas.

Early in the spring of 1942, the officers concerned with chemical warfare research and development realized that a more efficient method for producing large quantities of

smoke had to be devised. Smoke had been found to provide one of the cheapest and most effective means of preventing enemy bombers from hitting vital targets in rear areas. Indeed, no successful bombing of an area protected with smoke has yet been recorded.

Co-operating very closely with the Army Service Forces is the National Defense Research Committee of the Office of Scientific Research and Development, of which Karl T. Compton, President of Technology, is a member. Many important and spectacular developments have resulted from the pioneer research of this committee. To them was presented the problem of finding the best possible kind of smoke. The result of this request is an outstanding example of the splendid co-operation existing between our civilian technical organizations and our military. It is not merely an illustration of teamwork among the scientists of the N.D.R.C., the technicians and engineers of industry, and the officers and men of the Chemical Warfare Service of the Army Service Forces, but is also an example of how even during the stress of war an abstract, theoretical idea may in a relatively short time be worked out and developed into a final piece of war equipment of decided effectiveness in the field.

Prominent in the work of the N.D.R.C. and internationally renowned as a distinguished scientist is Irving Langmuir, Nobel Prize winner and associate director of the General Electric Company's research laboratories in Schenectady, N. Y. Dr. Langmuir and his associates were asked to produce the ideal smoke. He attacked the problem from the point of view of pure science. He marshaled his formulas, made his calculations, and concluded that size, color, and density of the smoke



*Photo by United States Army Chemical Warfare Service*

*A smoke-generator company carrying out a lateral screening mission, using the new generators which produce an effective smoke through the breaking up of a special oil by steam*





*Photo by United States Army Chemical Warfare Service*

*The M1 mechanical smoke generator in action*

particles determine the effectiveness of any smoke. Of these factors, size seemed to be the one on which he should concentrate.

A screening smoke is a cloud of extremely small liquid or solid particles suspended in the air. A smoke screen accomplishes its purpose by scattering rays of light through reflection caused by the many individual particles suspended in the air and also to some extent by actual obstruction of the light rays. The scattering of light rays by smoke particles depends upon the number of particles in a given air space. According to Dr. Langmuir, the particles must be of a certain specified size to have greatest effectiveness. Having arrived at the theoretically ideal particle, he next had the task of building a generator that would produce a smoke to fit the specifications he had established. He assigned this problem to Vincent Schaefer, his assistant. Schaefer, working in his laboratory at the General Electric Company, made a number of models before he found one which seemed to produce a smoke particle that met the theoretical specifications of Dr. Langmuir. This he tested in a large "smokebox," from the top of which he could look down through his smoke screen upon various colors and shapes in much the same way a bombardier would look through a cloud set up over a ground target. The machine was now ready for the pilot-model stage; this job was allotted to the Standard Oil Development Company on a research contract.

Here we have applied science coming into the picture. Pure science in the persons of Dr. Langmuir and Vincent Schaefer had determined the specifications for and the nature of the ideal smoke and had worked out a scheme for producing it. Applied science through the medium of Standard Oil was to build a smoke machine which would produce vast clouds of a smoke of the given specifications.

Dr. Langmuir had been given his directive in early spring. The solution of the problem had taken him only a few weeks. Of course, he had given some thought to this

subject before, and perhaps had devoted study to similar projects. The specific problem, as defined by the Chemical Warfare Service and the National Defense Research Committee, however, was first given to him some time in February or March of last year. He was ready to have his theories applied by the end of April. He held conferences with the engineers of the Standard Oil Development Company from May 2 to May 5, 1942 and with them established certain factors having to do with the capacity and design of the equipment.

The design of a unit which would produce smoke by breaking a special oil down into tiny particles by means of steam began immediately. One month later the first smoke generator unit was completed, and in June the unit was tested in Schoharie Valley near Schenectady. These tests were witnessed by representatives of the Army, the Navy, the N.D.R.C., the National Research Council of Canada, and several industrial companies. Soon thereafter the equipment was transferred to the home station of the Chemical Warfare Service at Edgewood Arsenal, where it received its final tests. These were so successful that a commercial contract was immediately let to the

Heil Company at Milwaukee, Wis., to manufacture the smoke generator unit in quantity. The first unit came off the production line quickly, and final tests and inspection were completed on July 24. The National Defense Research Committee had received the problem, turned it over to Dr. Langmuir, who had done his share and turned it over to industry so that in less than six months a machine had been devised which was many times more effective than the early smoke oil-burners and was the best large-scale smoke producer ever developed.

The story is not yet complete. Smoke generator test companies were formed and equipped with the new machines. They were sent to Cape Cod to work with the amphibious units then in training, and by the end of the summer these units with the new mechanical smoke generators were sent overseas to Casablanca, where they went into active operations. This was truly a triumph of co-ordinated research, development, manufacture, organization, and training—the wedding of pure and applied science. Since that time, many chemical smoke-generator companies have been activated with the M1 mechanical generator as the standard equipment. A number have been sent to our active theaters. Reports have been made of the splendid service these companies rendered in North Africa and Sicily. Many more are in training in this country.

The M1 mechanical smoke generator which resulted from Dr. Langmuir's research actually produces a dense white fog instead of a smoke. This fog is almost odorless and, unlike smoke from the earlier generators which partially burned oil, contains no sooty particles and therefore does not stain or deposit carbon on surfaces with which it comes in contact. This fact is important in a thickly settled community. The screen is produced by the steam distillation of a special petroleum product. The resulting fog or smoke is made up of droplets which are uniform in size and of extremely small diameter. Their size conforms to the specifications set by Dr. Langmuir.

The machine has a source of power for driving the hot liquid and steam through spray nozzles. Water, fuel, and the compound to be sprayed are carried in large tanks. All of this is mounted on a base which can be carried on a trailer, a barge, or a truck, or can be placed on the ground in a fixed position.

The smoke has a very high persistency. Clouds which have been generated from a single line of generators have been observed a good 20 miles downwind, hanging together all the time and giving an obscuring screen for at least half the distance. Previously, 10 miles had been considered an extraordinarily long distance for any smoke cloud to travel.

The length of the cloud travel with generators of this type makes it possible to cover landing fields and large industrial areas in such a way and from such a distance that the enemy has no aiming points relative to the target which he may use successfully in directing his bombs. A small smoke screen might well serve to call the attention of the bombardier to a target and to delineate it for him. The screen from the M1 mechanical generators covers such tremendous areas, especially when several lines of them are used, that the enemy has practically no chance of hitting a vital point. One of the recent reports received from overseas quotes a conversation between two enemy fliers in the air over North Africa. In the conversation, one flier said to the other: "There's no use trying to bomb your objective. It's covered with that damned smoke."

It is easy to imagine the difficulty that the bombardier is faced with when he finds himself over a target covered with smoke for many square miles. He must either drop his bombs indiscriminately in the smoke with a faint hope that they will damage an important installation in the area, or he must find some other location that is uncovered. The choice is not an easy one. If a pilot has come several hundred miles with a mission of bombing a power station or an oil refinery and he knows that the target is somewhere within the area of the smoke, he may be inclined to take a chance and hope his bombs will reach a profitable objective. An alternative target which may

have been assigned might also be screened, or it might be protected by powerful fighter planes or by heavy anti-aircraft artillery defenses.

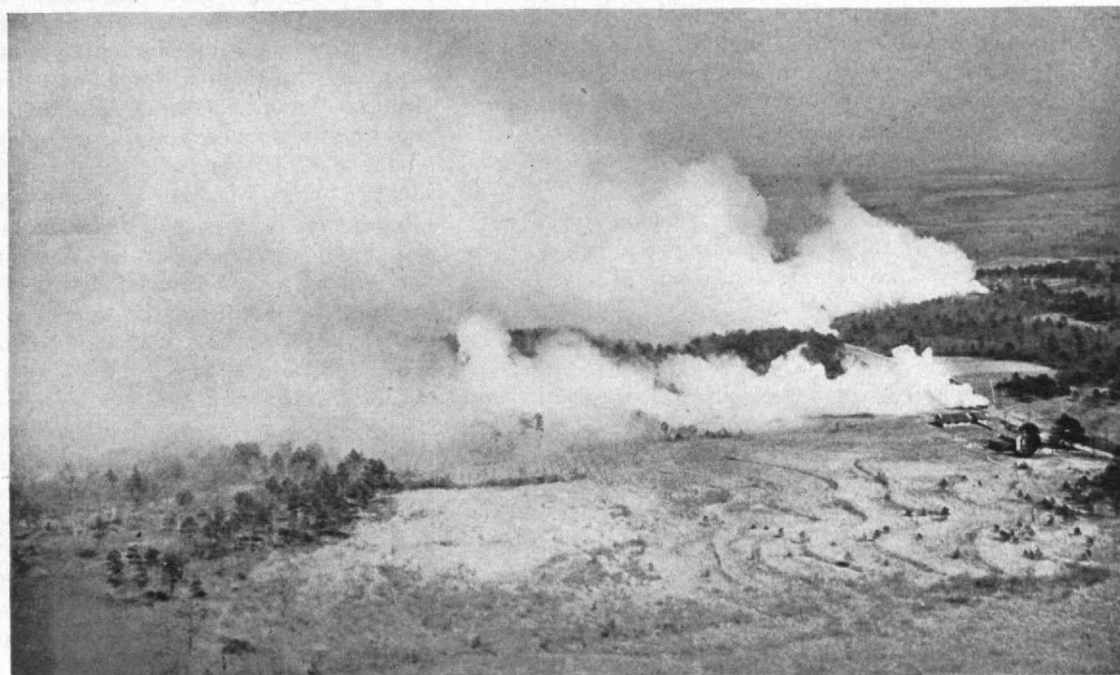
Our American theory of bombing lays great stress on accuracy. Our air force believes and is proving daily that our bombardiers can hit their targets a reasonable percentage of the time. We don't like to try to hit something we can't see. We believe that point bombing is more profitable than area bombing. Smoke properly placed makes precision bombing impossible. "If you can't see 'em, you can't hit 'em."

In the daytime, the screen is wide enough and high enough to cover not only the vital point but also most landmarks or aiming points. At night a dark-colored screen not only obscures a target but has a valuable camouflage effect. From a high altitude, a gray smoke, even in the moonlight, has the appearance of a body of water. The pilot or the navigator, seeing what looks like a large lake where he had expected to see no water, is confused. Regardless of the camouflage effect, however, the smoke screen is obscuring. Although airplanes can look behind a smoke screen, they cannot look under it.

The tactics of smoke-screening large areas are being developed rapidly, and although each area to be obscured must be treated according to the peculiar conditions of wind, weather, and terrain existing in that particular place, there is a general method of procedure that has been carefully worked out. Generators will ordinarily be stationed at selected points to the windward of the place to be screened and will be moved if the wind shifts. In case of an air-raid alarm, the smoke blanket will be started from generators close to the vital point, the distance depending upon how hard the wind is blowing. A second line of generators will commence operation 400 to 500 yards to windward. As their smoke reaches the point that must be protected, the close-in generators will fan out to previously selected positions still farther to windward.

The standard burning-type smokepots which produce smoke clouds immediately are used to start an initial screen while the generator is (*Concluded on page 96*)

*Drifting and clinging, the smoke produced by the Chemical Warfare Service's new generators blankets an area in tests.*



*Photo by United States Army Signal Corps*



# Today's Airplanes Tomorrow

## *Sound Plans for Peacetime Handling of Wartime Transport Fleets Are Essential to Safeguard the Industry and the Nation*

BY L. WELCH POGUE

TRANSPORT aircraft are a vital national asset today. As a nation, we woke up late to the fact that this is an air war. In some respects, we woke up still later to the crying need for transport aircraft. There are those who still stoutly maintain that the principal war use for the transport aircraft is to carry air-borne troops and task-force equipment to the field of battle. But do we use the 150,000 miles of air transport routes, which are operated by and under the direction of the armed forces today, to carry only parachute troops and ammunition? The fact is that the planes which fly these routes carry, just as our merchant marine does, a great variety of what is needed, and constitute a line of fast communication generally, which is indispensable to modern war. Apart from this vast military air transport service, the drastically curtailed fleets of our commercial carriers still operate some 110,000 miles of regular routes gorged with the vital traffic generated by an expanded war economy. Many keymen went from these commercial air lines to join the Air Transport Command and the Naval Air Transport Service, where they have helped to build up the globe-encircling routes which I have mentioned.

Because as a nation we had not foreseen the vital war need for transport aircraft, we were late in starting to supply that need. Now we are under way. By the time we have won this war, we shall have a vast air transport fleet and vast air-transport production capacity.

The possession of this great machinery of war in peacetime, however, may prove as big a problem as the lack of it proved at the outset of the war. Let us not be caught flat-footed a second time. Unless we make wise plans in advance for the peacetime handling of this wartime fleet and this wartime capacity, our progress in air transportation and aircraft development may be arrested for a decade. The government alone can take effective action, for the principal reason that it will own the airplanes which create the problem.

If there is no planning, and if the surplus aircraft on hand at the end of the war are simply peddled to the highest bidder, we may be reasonably sure of the following consequences: (1) A vast and costly defense reserve will have been wasted; (2) the transport aircraft market will be glutted for years to come; and (3) the capacity to manufacture and develop transport aircraft will suffer a blow from which it will take years to recover. This last consequence would be the gravest by far. The possession of a static reserve fleet of several thousand transport aircraft in condition to fly provides only short-term defense insurance. No other instrument of war or peace becomes obsolete so fast as an airplane. Aviation preparedness for either war or peace can be represented only by the power and capacity to supply continuously new and improved aircraft.

Before discussing machinery for the handling of the war air transports we shall have on hand at the close of hostilities, I should first like to place in broad perspective the magnitude of the surplus aircraft problem with which we shall probably be faced. Aircraft manufacturing capacity has had meteoric growth in the United States during the last two years. It was a relatively small industry in 1941. In that year, manufacturing production of automotive equipment reached the \$3,700,000,000 mark, and aircraft manufacturing in dollar volume was way down the list. In 1939, the latest year for which comparative statistics are available, it was only 44th in importance among our industries. It is a twenty billion dollar industry this year. Next year it promises to be approximately a thirty billion dollar industry. If next year's promise is fulfilled, the industry will be more than eight times as large as the automobile industry was at its all-time peak.

This enlarged industry is now directly employing over one and one-half million people. It would probably be impossible to ascertain accurately the additional number who are contributing indirectly to the production of raw materials required for the manufacture of aircraft and engines, but we can be sure that the figure is several million. The older aircraft companies, after tremendous expansion, account for about three-fourths of the persons directly employed today. The remainder are those employed by automobile and other companies which are helping out in the aircraft production program.

The first questions that occur when we reflect on the problem of surplus aircraft are: How many aircraft and what kinds of aircraft are we talking about? Combat planes can largely be eliminated from consideration because most of them will not be available for sale or disposal on the open market. Although some bomber types could perhaps be converted for transport operation, this would be a costly and inefficient undertaking. Further to increase in this fashion the large surplus of transport aircraft which will surely be on hand at the war's end would be "carrying coals to Newcastle" with a vengeance. The principal kinds of aircraft we are talking about are the transports and the smaller types of planes used for training, courier service, and the like.

The public has been told of the production goals of about 90,000 aircraft in 1943 and about 125,000 in 1944. These figures represent gross tonnage of approximately 425,000 for 1943 and 638,000 for 1944. In view of the tendency to shift to larger types, tonnage is more realistic than number. The exact fractions of these totals which are combat planes, transports, bombers, and so forth, are not publicly known. It seems reasonable to estimate, however, that present schedules will call for the production of approximately 15,000 transport aircraft for a current year. These will include some smaller planes.

War is a hard master. Many aircraft already produced or to be produced will not appear in the final inventory. However, in terms of peacetime civil air transportation, by any method of estimate, the number will be very large. In 1940, United States output of aviation gasoline for all purposes was approximately 619,000,000 gallons. Under the normal peacetime standards of aircraft utilization, this gasoline would be sufficient to operate only approximately 2,000 of the sort of planes which would be represented by our war surplus. This rough measure should afford food for sober thought upon any proposition to maintain in continuous operation large numbers of transport aircraft which are markedly less efficient in the use of gasoline than would be new types designed to take full advantage of latest developments in aircraft and engine design and improvements in aviation fuel.

The war has, of course, provided a fabulous laboratory for the development of aviation in every respect. The best of our engineering talent has been assembled and given the green light. This focusing of talent in the engineering and development laboratory of modern war means that progress is made not by the year, the month, or the week but by the day, the hour, and even by the minute.

Assuming the very best possible job to have been done by the Army and the Navy in their specifications and designs, all the aircraft that will have been produced by the summer of 1944 will be obsolete as compared with those which incorporate all of the known developments and improvements then available. Not only would it be possible now to design and build an airplane more efficient than any pre-war type; it would be possible to improve on every plane now being built. That is no one's fault. It is the price we pay for progress. It is a cheap price when the value of improvements is considered. But it means that probably every plane in the category of surplus transport aircraft at the end of the war will, even if otherwise in good condition, be obsolete in terms of what our factories are then capable of producing. Or perhaps I might better say, what our factories *should* then be capable of producing. I shall mention this distinction later. At the moment, I suggest that the state of preparedness of our factories for peacetime production at the war's end should have a most important bearing upon the whole problem of working out the most efficient disposition of surplus transport aircraft.

A closely related factor is the need for an intelligent program of tapering off production at the close of the war. In all probability the aircraft manufacturing industry will still be running at high volume, and the surplus of aircraft will inevitably be increased by some unavoidable further production. We shall indeed be derelict, however, if we do not exercise the greatest care and wisdom toward preventing needless swelling of the formidable surplus which will already be on hand.

As I have previously indicated, the lack of a well-worked-out plan for coping with the surplus aircraft problem would doubtless result in the government's following the traditional policy of knocking down all surplus equipment to the highest bidder, with consequent saturation of both domestic and foreign markets. In addition to the unhappy consequences upon the manufacturer of flying equipment and the economy of the country in general, the result would prove anything but a boon to the United States air transport industry. This industry's health cannot be predicated upon tomorrow's use of today's airplanes. Its future growth, like its past growth, is intimately linked with the uninterrupted development of new and increasingly more efficient aircraft.

Nor would it be wise to dump these aircraft on the foreign market indiscriminately. Being a nation of outstanding excellence in transport aircraft manufacture, we shall be overlooking an important consideration if we do not weigh carefully how our own interests dovetail with those of foreign countries, and then make the necessary adjustments. Our own good reputation as the vendors of efficient aircraft might be protected better by some kind of a program which would make surplus aircraft available to meet temporary requirements pending the time when more efficient aircraft become available for purchase. This plan would keep the market fresh and vigorous.

As an alternative to dumping, the surplus aircraft might be scrapped. Of course, some would need to be preserved to take care of the immediate and pressing needs of United States and foreign carriers. Scrapping would have the advantage of preserving the available market. It would have the obvious disadvantage of liquidating a very large and costly fleet which might serve for a while as a valuable war reserve or as an instrument in the maintenance of peace for a number of post-war years. At this time no one (*Continued on page 98*)



Official photograph, United States Army Air Forces

*A transport plane being loaded—present power which demands forethought for the future*



# Industrial Building Trends

*Factories and Plants Must Be Calculated for the Work to Be Done in Them; Thus Economy Is Assured*

BY HERBERT S. SWAN

TO be geared for the maximum progress, every city must have not only efficient labor, efficient machinery, and adequate facilities for transportation, but also modern, up-to-date factory buildings. Housing the latest machinery in an antiquated structure is an anachronism, and achieves but a fraction of the maximum potential progress immediately possible in industry. The plant, instead of becoming a pacesetter in its particular line, remains a marginal or a near-marginal unit in the industry. The task challenging the industrial leaders of a community, therefore, is nothing less than the elimination of all waste and obsolescence in the economic structure, whether it may involve the retraining of personnel in industry to new skills, the installation of up-to-date equipment, or the construction of new factory buildings.

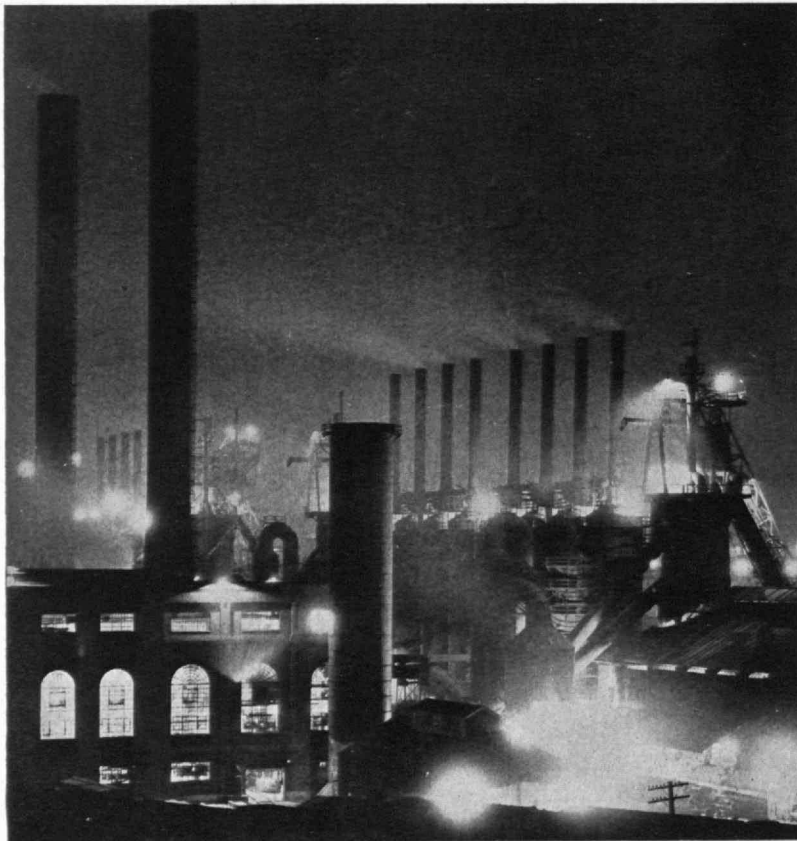
If cities are to equip themselves for the highest standard of living now possible and within reach, the great number of worn-out machines as well as the century-old buildings housing them must be replaced with the best available; otherwise, the great social gains made by labor during the past few years will prove wholly abortive. Unless as many units of goods are produced at no greater cost in a 40-hour week today as were produced in a 50- or 55-hour week several years ago, there has been not social

progress but social retrogression. To progress we must produce more units at less cost. Not to do so means that we are slipping either into a static or into a permanently lower standard of living. Any improvement in method or equipment by a competitor must eventually be accepted by all if they are to survive. Every community has a huge problem of industrial rehabilitation upon its hands if it is to place its industries abreast of the present technological advance. In the average city no other phase of this problem is more difficult than the financing of the construction of satisfactory manufacturing plants.

Until comparatively recently, the productive machinery of an industry was fitted to the building housing it. The building was constructed first; equipment was adapted to the limitations of the building. In the best practice today this procedure has been changed. Now emphasis is placed not so much upon the building as upon serialization of the several manufacturing functions carried on under the roof — articulation and grouping of departments, reception and routing of materials through various fabricating processes in straight-line production, and the shipment of finished goods — so that the over-all cost of manufacture may be reduced

to the lowest possible figure. Light, air, ventilation, wholesome working conditions, freedom from obstructing columns, interchangeability of floor areas within the building, possibility of expansion of operations without disruption of the organization, and every other consideration which reduces unit costs and speeds output have become objects of primary importance to the design of factory buildings. Under such conditions, is it surprising that the purchase or lease of almost every ready-made plant is scrutinized from the point of view of second-rate layout, or that old plants should possess practically no resale value?

In certain industries the change in demand for products has made it impossible to produce new products in older mills. In so far as depreciation and obsolescence are concerned, the old mills could be used for many, many years to come in making the old products, but the demand for new types of products by consumers has necessitated widespread scrapping of the old plants and the construction of new ones. Moreover, new buildings in many industries may be demanded more by the changing technique in manufacture than



General Electric Company

*By night, an industrial plant is a dramatic focus of energy.*

by the pressure of increased demand for additional products, but that fact does not make an efficient plant any less desirable. If the mechanism could be devised for financing construction, the engineering advances made in plant design would frequently be found to effect such economies in production that a given over-all capacity could be obtained at an appreciably reduced cost per unit. Large-capacity equipment, requiring less floor space per unit of productive capacity, effects a substantial reduction in heating, maintenance, operation, as well as repairs; improved illumination and modern methods of handling materials and goods so improve the efficiency of personnel as to lower labor costs. In other words, a plant which takes advantage of available improvements soon pays for itself out of savings.

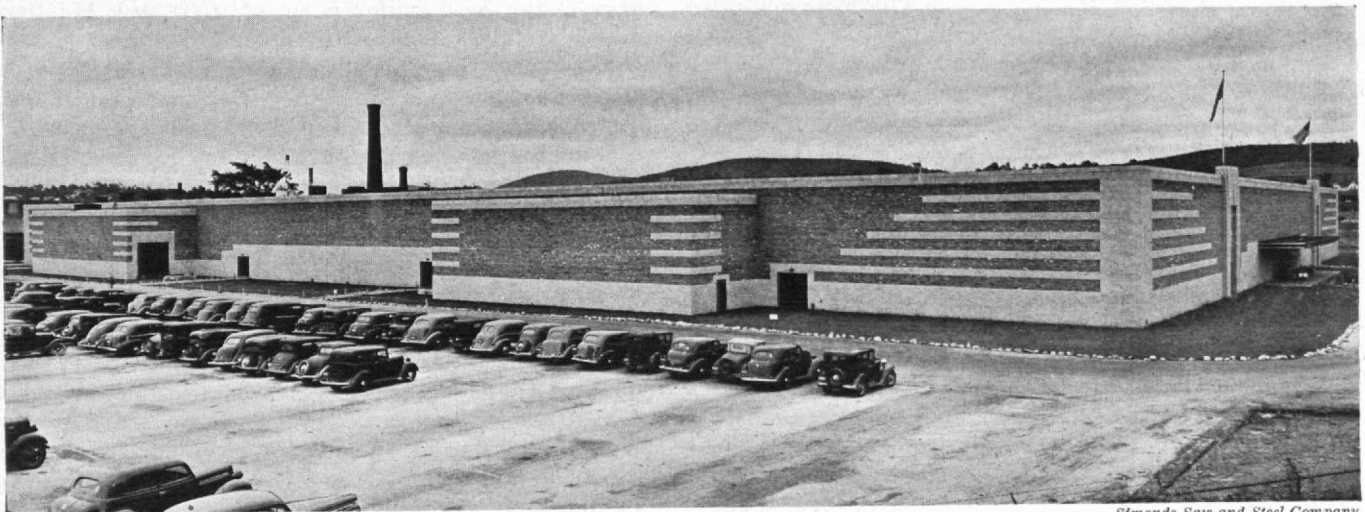
The trend toward one-story factory buildings emphasizes the importance of a spacious plot in an open area with low land values. To obtain adequate daylight illumination through either saw-tooth, monitor, or belt windows, a low building must be surrounded with ample open space. If it is flanked with other buildings, these too must be low or else they will appropriate to themselves light desired for the low factory building. Low land values are essential no less for minimizing capital investment in fixed assets than for keeping down annually recurring taxes on real estate. Frequently the need for parking many hundred and sometimes even several thousand cars also places a premium upon a location with low land values.

Desire to obtain efficiently designed buildings is attracting many industries to communities which, until a few years ago, would have been considered ineligible for such purposes. Whatever the shortcomings these communities may possess, the disadvantages are more than compensated for by the economies resulting from more satisfactory buildings. This is really an understatement of the situation, for as a result of the automobile, the truck, and the airplane, many communities in rural areas and on the peripheries of large cities are today really the most desirable locations, whereas at one time they would have been considered submarginal areas because of transportation problems. Frequently it is the central portions of our cities and not the sparsely settled suburbs surrounding them which constitute the present submarginal areas for industry.

A few years ago nearly every city was concerned with the need for incubator loft buildings, and as a result many multiunit loft buildings were erected for small organizations in the heart of a city. Though many of these proved successful and are still useful buildings, they have by no means served all of the building needs of small plants. Since these were, as a rule, multistory buildings, the elevator problem in them often became acute. In the unloading of raw materials and in the shipping of finished goods, considerable time was lost as a result of elevator congestion. Strikes in one loft often spread to other lofts. Labor disturbances affecting elevator operators, engineers, and persons engaged in other services frequently embarrassed and even paralyzed the satisfactory operation of the plant. All ground being covered with buildings, cars of employees could not be parked upon the premises, and parking was prohibited in the streets because of their narrow width. Moreover, if additional space were needed for expansion, the plan and present occupancy of the surrounding floor space made such changes either impracticable or impossible. When an occupant of a loft sought new quarters, he often found that it was just as easy to roll his machinery and equipment 50 or 100 miles away to a neighboring city as across the street or a block away within the same neighborhood. It is not without reason that loft buildings have lost in popularity with all concerned — the occupants, the owners, and the community.

Such considerations are leaving their impress not only upon the design of new industrial buildings but upon the scrapping of old structures. They frequently effect migrations of industry. At the time an organization junks an old plant, it carefully reviews the desirability of maintaining operations at its present location. To be successful, a 100 per cent plant demands a 100 per cent location. Erection of a new plant, therefore, frequently synchronizes with the removal of an industry to a more economic location.

The capital financing the construction of loft buildings is usually advanced by speculative interests dissociated from the industrial operations carried on within the buildings. Hence construction of loft buildings is unlike that of ordinary factory buildings which are commonly built for owner occupancy. In background, the erection of lofts is, indeed, less similar to the (Continued on page 104)



Simonds Saw and Steel Company

Precision work is done in self-contained production lines in the single five-acre room of this windowless factory.



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# THE INSTITUTE GAZETTE

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PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

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## *For the Future*

**S**PECIFIC objectives to be considered for development in the future, and the philosophy of transition from intensive research and training for war to the purposes of peace when the Institute's responsibilities in the present emergency have ended, were discussed in the second part of President Compton's report to the Corporation, summarized below. From the activities of the past year, described in *The Review* last month, Dr. Compton turned to prospects of the future and the opportunities suggested by recent technical developments.

He directed special attention to applied mathematics, a field in which the Institute has always been strong, both in its Department of Mathematics and in its related engineering and scientific Departments. "Even before the war," said Dr. Compton, "there was a growing nationwide movement to strengthen applied mathematics. As part of this movement, we set up an interdepartmental staff committee to promote the development of this field and set aside an initial sum of \$10,000 to provide a limited number of postgraduate or postdoctoral fellowships. As a further move, the Executive Committee has recently set aside \$25,000 to be used as circumstances permit to increase the Institute's opportunities and effectiveness in applied mathematics."

Turning to other fields, Dr. Compton continued: "Without knowing much of the detail, the public is well aware that remarkable progress has been made, under the stimulus of the war, in the theories and useful applications of electronic tubes and associated electrical circuits, which are generally and somewhat loosely described by the term 'electronics.' This has been for some years an important activity in our Departments of Physics and Electrical Engineering. It is evident that this field is rapidly growing in importance and that the Institute has for various reasons a unique opportunity to play a leading role in its further development. In order to insure our ability to take prompt steps in this matter as opportunities arise, the Executive Committee has recently set aside an initial sum of \$50,000.

"The ingenious design of special instruments along sound engineering lines is partly dependent upon native ingenuity and partly upon sound scientific and engineering training. Because we are the type of institution which we are, and because we have been unusually fortunate in having on our staff individuals who combine native ingenuity and sound training in a remarkable degree, one of our lines of notable achievement has been the invention and development of instruments. In fact, we have been given both moral and practical encouragement from a very important governmental user of highly technical instruments, in order that we may serve as a still more effective center for developing instruments and for training instrument designers. As a step to promote further progress, the Executive Committee has recently set aside the sum of \$25,000, again to permit

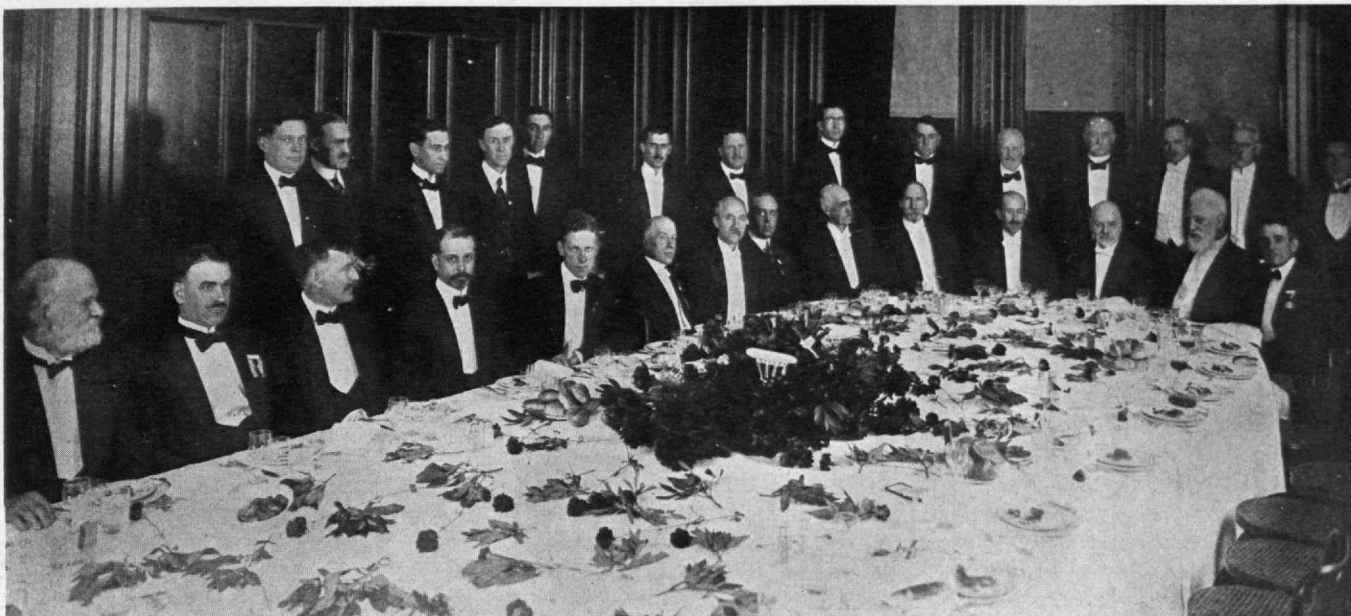
prompt action on new opportunities in this direction. Furthermore, we plan in the near future to assign to an interdepartmental group the responsibility for the further development of our educational program in this highly important field, which is on the one hand specialized but on the other hand very wide in the scope of its applications.

"Several recent Visiting Committees of the Corporation have emphasized the rapidly growing importance and scope of organic chemistry, both in its theoretical developments and in the multiplicity of its important industrial applications. We certainly have no need to be ashamed of our past record or present position in organic chemistry, which has been and is now one of the important branches of our undergraduate, postgraduate, and research work. However, the opportunities that have been emphasized by our Visiting Committees are so real as to justify, in my opinion, a special effort to strengthen still further this aspect of our program.

"The M.I.T. established the first Department of Architecture in the United States, and it has been one of our finest in its background of prestige and usefulness. During the past dozen years the problems of architecture and of architectural schools have been complex and difficult. It was one of the professions hardest hit by the depression. This obstacle, followed by the war, came just at the time when the Modern, or functional, architecture appeared in the field as a competitor with the more classical point of view. Though the exact outcome of this competition cannot be predicted, it is abundantly clear that the new movement is having a profound effect upon architectural thinking and practice. The trends emphasize the value of a technological environment around an architectural school. Pertinent to the situation is the fact, established by the National Roster of Scientific and Specialized Personnel, that the average age of professional architects in this country is higher than that of the members of any other profession. Just what the significance of these facts may be in guiding the further development of our School of Architecture is not entirely clear, but the problem certainly requires careful study.

"The Visiting Committee on the Library, the Faculty Library Committee, and the Friends of the Library have independently and jointly called attention to the cramped and inappropriate quarters of our Central Library and to our need for a well-planned, conveniently located, and properly appointed library building. The growth of the Institute and the importance of its Library demand that this new facility be on the 'must' list of postwar projects.

"In several previous reports I have called attention to the desirability of more adequate provision for living and recreational facilities for students. To some extent the objectives there set forth have been realized through actions by the Corporation and through the generous response of the Alumni. Of outstanding importance have been the acquirement of the Graduate House and the construction of the Alumni Pool, Briggs Field House, and track facilities. It is an exceedingly fortunate coinci-



Notable among the festivities connected with the Institute's removal to its Cambridge quarters 27 years ago was a dinner in honor of Orville Wright, given at the Engineers Club in Boston on June 12, 1916. The plane which Dr. Wright and his brother Wilbur had used in their conquest of the air 40 years ago this month was exhibited when the Institute's new home was opened. This photograph was made available to *The Review* by Lester D. Gardner, '98, President of the aeronautical archives of the Institute of the Aeronautical Sciences. Those present, with the positions they then occupied in the world of science and engineering, were as follows:

Seated, left to right: (1) John Ritchie, Jr., M.I.T., publicity; (2) C. P. Page, Van Blerck Motor Company; (3) Arthur E. Kennelly, Professor of Electrical Engineering, M.I.T.; (4) Edwin B. Wilson, Professor of Mathematics, M.I.T.; (5) Philip J. Roosevelt of New York; (6) James P. Munroe, '82, Secretary of the Corporation, M.I.T.; (7) Godfrey L. Cabot, '81, President, Aero Club of New England; (8) Paul W. Litchfield, '96, President, Goodyear Tire and Rubber Company; (9) William E. Byerly, Professor of Mathematics, Harvard; (10) Rear Admiral Washington Lee Capps, chief constructor, United States Navy; (11) Orville Wright; (12) Cecil H. Peabody, '77, Head of the Department of Naval Architecture and Marine Engineering, M.I.T.; (13) Alexander Graham Bell; and (14) Edward M. Hagar, '93, President, Wright Company.

Standing, left to right: (1) J. H. Barbazette, Wright Company; (2) Lester D. Gardner, '98, publisher, *Aviation*; (3) A. Roy Knabenshue, pioneer airship pilot; (4) Joseph C. Riley, '98, Associate Professor of Heat Engineering, M.I.T.; (5) Raymond Ware, Thomas Motor Car Company; (6) Thomas H. Huff, '15, instructor in aeronautical engineering, M.I.T.; (7) Alan R. Hawley, President, Aero Club of America; (8) Glenn L. Martin, Glenn L. Martin Company; (9) Oscar Brindley, holder of the Curtiss Marine Flying Trophy; (10) Robert W. Willson, Professor of Astronomy, Harvard; (11) Arthur G. Webster, Professor of Physics, Clark; (12) Jerome C. Hunsaker, '12, assistant naval constructor, United States Navy; (13) James Means, publisher, "*Aeronautical Annual*," 1896-1899; (14) Alexander Klemm, '16, instructor in aeronautical engineering, M.I.T.

dence that these added facilities were secured before the war, because without them it would have been utterly impossible for us to undertake anything comparable with our present program of co-operation with the Army and Navy in their special training programs, for which housing and recreational facilities have been absolute requirements. Useful as these recent acquisitions have been, much remains still to be achieved before we can present to the student and his parents a situation that is actually, as well as competitively, in reasonably good balance with the more strictly educational and professional opportunities which are available here. I hope very much that means may soon be found to carry out those parts of this program which are still notably lacking in providing for our students a fully healthy and inspiring environment.

"The foregoing list of special subjects for postwar planning is not intended to be exhaustive. There are many other points deserving special attention, many of which have been suggested by and worked upon by members of our staff. In fact, there is no aspect of our activities which should not soon be carefully examined in order that our over-all use of facilities of staff, funds, and equipment may be attuned to the technological opportunities and trends of the times in such manner as to make Technology the most effective agency which it is

in our power to achieve within the general scope of interests specified in our charter."

### Opener

THE Alumni Council held its 234th meeting, inaugurating this season's activity, at the University Club in Boston on the last Monday in October. Francis J. Chesterman, '05, President of the Alumni Association, presiding over the gathering of 74 members and guests, opened the meeting with greetings from new alumni term members of the Institute Corporation and introduced, as new members of the Alumni Council, Joseph W. Wattles, 3d, representing the Class of 1908; George A. Johnson, representative of the Class of 1923; and J. Merrill Hanley, '18, representative of the Technology Club of Rhode Island.

Highlighting the reports of officers and committees which constituted much of the business of the meeting was the report of Henry B. Kane, '24, Director of the Alumni Fund, which showed that at the end of the seventh month of its fourth year the Fund had received \$91,984.94 from 7,590 Alumni. Both figures, Mr. Kane stated, represent advances over the record for last year at the same time. The total of contributions has increased 15 per cent; the number of contributors, 4 per cent; the average contribution, \$1.15 over last year.



Resolutions in memory of Herbert T. Gerrish, '08, were presented by H. Leston Carter, '08, chairman of a committee including Franklin T. Towle, '08, and Henry K. Spencer, '09. They emphasized Mr. Gerrish's long service on the Council as class representative since 1910. A silent rising vote accepted the resolutions.

Alumni Day 1944 will be held on Saturday, February 26, not on March 4 as previously announced. Chairman of the event is Herbert R. Stewart, '24, elected at this session of the Council.

As speakers of the evening, the Council was fortunate in having both Dr. Compton and Vannevar Bush, '16. President Compton reviewed informally the widely varied work of the Institute during the year past, commenting upon the unusual demands it has imposed upon staff and facilities and evaluating it as a contribution to the war effort. He then introduced Dr. Bush, who discussed differences between this war and previous ones, explaining how the scientific organizations in Washington and elsewhere throughout the country are co-operating to further the military activities of the nation.

### *Conflict, Colleges, and Contracts*

THE vast program of training for Army and Navy personnel which American colleges were asked to undertake this year brought many new and unsuspected problems involving not only changes in curricula and acceleration of class schedules but new and perplexing administrative procedures. Not the least of these problems was that of the contractual relationships between the government and the educational institutions. These contracts cover facilities and services that include the housing and feeding of thousands of students, the teaching of special courses based on the academic standards of the particular institution, and in many instances the provision of comprehensive physical training programs, all on a no-profit, no-loss plan.

To establish a plan for uniform procedure throughout the country, assuring fair terms and provisions in all contracts, the armed services joined in the creation of the Joint Army-Navy Board for Training Unit Contracts. In addition to two members each from the Army and Navy, the board includes four representatives from the nation's educational institutions. These college administrative officers were asked to serve on the board as consultants, and they were chosen for their broad knowledge of educational business methods and their reputations for achievement in this field.

It is not surprising, therefore, that one of the college representatives is Horace S. Ford, the Institute's very able Treasurer, or that Technology was one of the first institutions to negotiate a contract with the Army Air Forces, when it undertook the training of a large group of meteorological students last spring. Mr. Ford's associates in the college group are Rufus C. Harris, President of Tulane University; Robert G. Sproul, President of the University of California; and Robert B. Stewart, Controller of Purdue University, who serves as chairman of the board, representing both branches of the armed services. Representing the Navy are Captain Cortlandt C. Baughman and James A. Fowler, Jr., counsel, Bureau of Naval Personnel, while the Army members are Colonel William F. Volandt, assistant chief of the Air Staff, Training, and Lieutenant Colonel Blake R. Van Leer, chief of the facili-

ties branch of the Army Specialized Training Division of the Army Service Forces.

The board has already accomplished much in anticipating problems that were certain to arise in negotiating contracts with a large number of institutions and has accelerated the publishing of Army and Navy manuals of procedure. It has approved uniform contract forms acceptable to both branches of the services and has developed standards to be applied in determining the rates for payment for college services and facilities. Above all, the board has made possible cordial and effective relations between the armed services and the country's educational institutions in a program of training that has required readjustments in space and time which colleges have never before been called upon to face.

### *Promoted*

ROSS M. CUNNINGHAM, Assistant Professor in the Department of Business and Engineering Administration, has been promoted to the rank of associate professor of marketing. Professor Cunningham joined the staff of the Institute in 1937. He was graduated from Harvard College in 1928 and was awarded the degrees of master in business administration and doctor of commercial science in 1930 and 1934 by the Harvard Graduate School of Business Administration, where he served as a research assistant from 1930 to 1931 and as instructor in sales management from 1931 to 1934. He held the post of associate professor of marketing at the University of Tennessee from 1934 to 1937, serving at the same time as an associate in economic research on the Tennessee Valley Authority.

William A. Reed has been advanced from the staff position of assistant to that of instructor in the Department of Chemical Engineering. He was graduated from Harvard in 1942 with the degree of bachelor of science and has just completed the work for the degree of master of science at the Institute.

### *Visiting Committee Report*

WORK of the Institute's Department of Biology and Biological Engineering is reviewed by the Corporation Visiting Committee for that Department in a report which The Review, in keeping with custom, summarizes below:

CONDITIONS resulting from the war made inadvisable a meeting of the Committee on the Department of Biology and Biological Engineering \* during the past year. Several members of the Committee, however, discussed the problems of the Department with its Head, Professor Francis O. Schmitt.

The Department's subjects are essentially of professional grade, and, as in other similar Courses, the number of students has been reduced by the war to a small fraction of the normal figure. The demands on the staff in connection with research problems directly associated with the war have, on the other hand, greatly increased. Some members of the staff are on leave of absence to the govern-

\* Members of the Committee for 1943-1944 are H. B. Richmond, '14, Chairman, Philip W. Moore, '01, William L. Campbell, '15, Duncan R. Linsley, '22, George B. Darling, '27, Detlev W. Bronk, and Thomas C. Parran.

ment. Much of the research work is being handled directly on contracts with government agencies. The Department, therefore, has had to operate on a day-to-day basis, and has not had the opportunity of initiating the changes it had hoped. Much thought is being given to the postwar period.

The public health option will be closed next June, in accordance with a previous recommendation of the Committee and by approval of the Corporation. The Course in Sanitary Engineering has already been combined with the Department of Civil and Sanitary Engineering.

For future solution is the determination of the best method of integrating the work in fundamental biology with the more obvious immediate applications in the field of biological engineering, which include the currently important subject of food technology. This must be done so that not only will work be carried on in current techniques but also fundamental research will be initiated and will lead ultimately to broader horizons. While the immediate administration of these activities does not present unusual problems, the long-range program presents many questions which must be considered by future Visiting Committees.

### Fiscal 1943

FROM the annual report of Horace S. Ford, Treasurer of the Institute, presented to the Corporation at its most recent meeting, an impressive picture is to be had of the way in which Technology's financial operations have been magnified by the special loads of wartime activity. Thus whereas in normal times the operation of the Institute occasions an annual turnover of \$4,000,000 to \$4,800,000, fiscal 1943's transactions amounted to some \$23,700,000. Of this sum, \$4,700,000 were involved in the

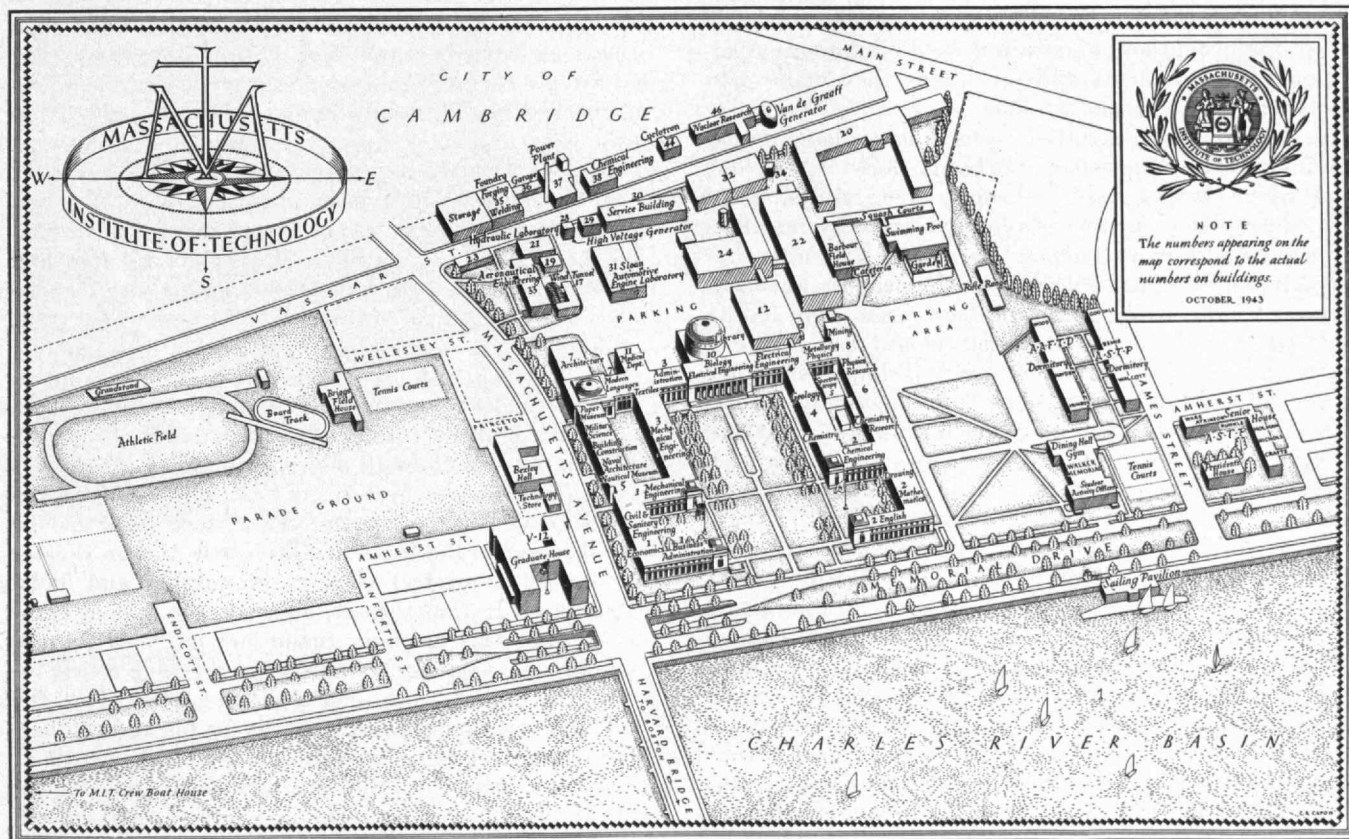
performance of the Institute's normal teaching, research, and administrative functions. Nineteen million dollars were involved in transactions having to do with war research, war training, and current fund operations connected with these.

Of this total of \$19,000,000, the sum of \$15,800,000 was under the supervision of the Division of Industrial Cooperation. During the year, 162 contracts were handled, of which 120 are still in force. One effect of this work appears in the increase of floor space this fall by more than 200,000 square feet in addition to the half-million square feet added during the past fiscal year.

The book value of the Institute's investments increased \$720,000 during the year, Treasurer Ford reported. Market value advanced nearly \$6,000,000, the ratio of market to book value on June 30 reaching 106 per cent, as compared with the ratio of 91 per cent recorded for fiscal 1942. United States Government bonds composed 28 per cent of all investments at the close of the year — the largest holding the Institute has had. Stocks amounted to 46.3 per cent. Mortgage holdings and cash advances for war-research and war-training contracts made up the remaining 16.7 per cent. Investment income declined, the allocation of 3.6 per cent to the pooled funds being the lowest recorded.

### Portrait

THE excellent portrait of George Eastman, painted several years ago by Seymour M. Stone of New York, has been presented to Technology by Mr. Stone. The portrait of the Institute's great benefactor had previously been loaned by the artist and has been on exhibition in the library of the Eastman Research Laboratories.



Alumni will see clearly expressed in this recent map how the Institute's increased activity is evidenced in additions of working space.



## THE REVOLUTION AT KITTY HAWK

(Concluded from page 84)

kites.) Likewise, the Wrights' idea of using a chain drive was not new. The Wrights were, however, the first to know that a loss resulted from superposing and how much that loss was; and their crossing of the driving chain into a figure eight was a new idea. But the important Wright inventions did not have to do primarily with superposed surfaces or the chain drive.

The noteworthy fact is that no matter what the Wrights used in the way of devices or knowledge possessed by their predecessors, they could not have flown except for fundamental scientific discoveries of their own — not to mention all they discovered regarding the flying art *after* they had first flown.

Knowledge of how to build wings of a shape to support a man-carrying, powered plane in the air — knowledge which they got by wind-tunnel experiments — was probably the Wrights' greatest contribution. They might have flown without use of their plan of presenting the right and left wings at different angles to the wind; or, rather, they might thus have flown a short distance in calm air — enough to demonstrate that flight was possible. But, on the other hand, it was the Wrights' basic method of lateral control which makes the airplane practical today. And, as already mentioned, their discovery of the use of the rear rudder as a balancing device, rather than as a steering mechanism, was fundamental. Their front rudder, which prevented nose dives, though not in use today, was itself a discovery of prime importance in carrying the inventors through the experimental stages. No predecessor had touched on any of the basic principles that made the Wrights' achievement possible, even if we do not include their work on propellers, which gave them knowledge far beyond any previously available regarding propulsion; and even if we do not mention additional improvements and inventions they made *after* the Kitty Hawk flights of 1903.

A few students of aviation seem to have thought that gliding machines which had been built before the Wrights', and which were capable of short, steep glides, could have been made capable of powered flight by merely a few minor additional touches. One should remember that though the Wrights' 1902 glider was leagues ahead of any ever built before and could have been propelled by only about half the power needed for any earlier glider, their first powered machine was not simply the 1902 glider with power added. Aside from containing an engine and propellers, the 1903 machine was a great improvement, as to dynamic efficiency, over the 1902 glider.

Another fairly widespread notion seems to be that French experimenters were close upon the trail of the Wrights and would probably have flown before long, even if there had been no Wright brothers. Actually, the knowledge that led to the first successful French experiments came from the Wrights. When their friend Octave Chanute, in a lecture and in writing at Paris in the summer of 1903, revealed the facts about the Wrights' 1902 glider, he made possible the beginning of French aviation.

It was as true in the United States as in France that no one had been ahead of the Wrights in designing a machine that could fly. In the trial of the patent-infringement lawsuit brought by the Wrights against Glenn Curtiss in 1909, the defendant's attorneys sought to

show that the Wright inventions had been anticipated by earlier experimenters. But the Wrights won their suit.

The aim of this brief survey of the record has been to make clear that the Wrights owed little to others for the physical components of their epochal invention. Their debt was rather for inspiration. Now, 40 years after the event, that debt has been discharged to a large degree by the usefulness of the inventors' achievement, by the air lines that encircle the world, and by the aerial fleets that carry war home to the aggressor. And now the debt that *we* owe to the Wrights may be greater than ever if, as is hoped, the airplane becomes an instrument to unite the world and insure peace.

## SMOKE, BUT NO FIRE

(Concluded from page 87)

getting up steam. They are also used to fill in the gaps. As soon as an unbroken smoke blanket extends from the outermost line of generators to the vital point, the area of the blanket is enlarged by moving the generators farther out, so that finally some of the screen may be several miles from the target the enemy is seeking to destroy. It is important that the outermost rank of generators be located on a broken line so that the smoke blanket will not appear as artificial to an enemy bomber but will produce the illusion of a natural terrain feature. Around a harbor or where the vital area is near the water, the generators may be placed on barges designed by the Chemical Warfare Service for this purpose.

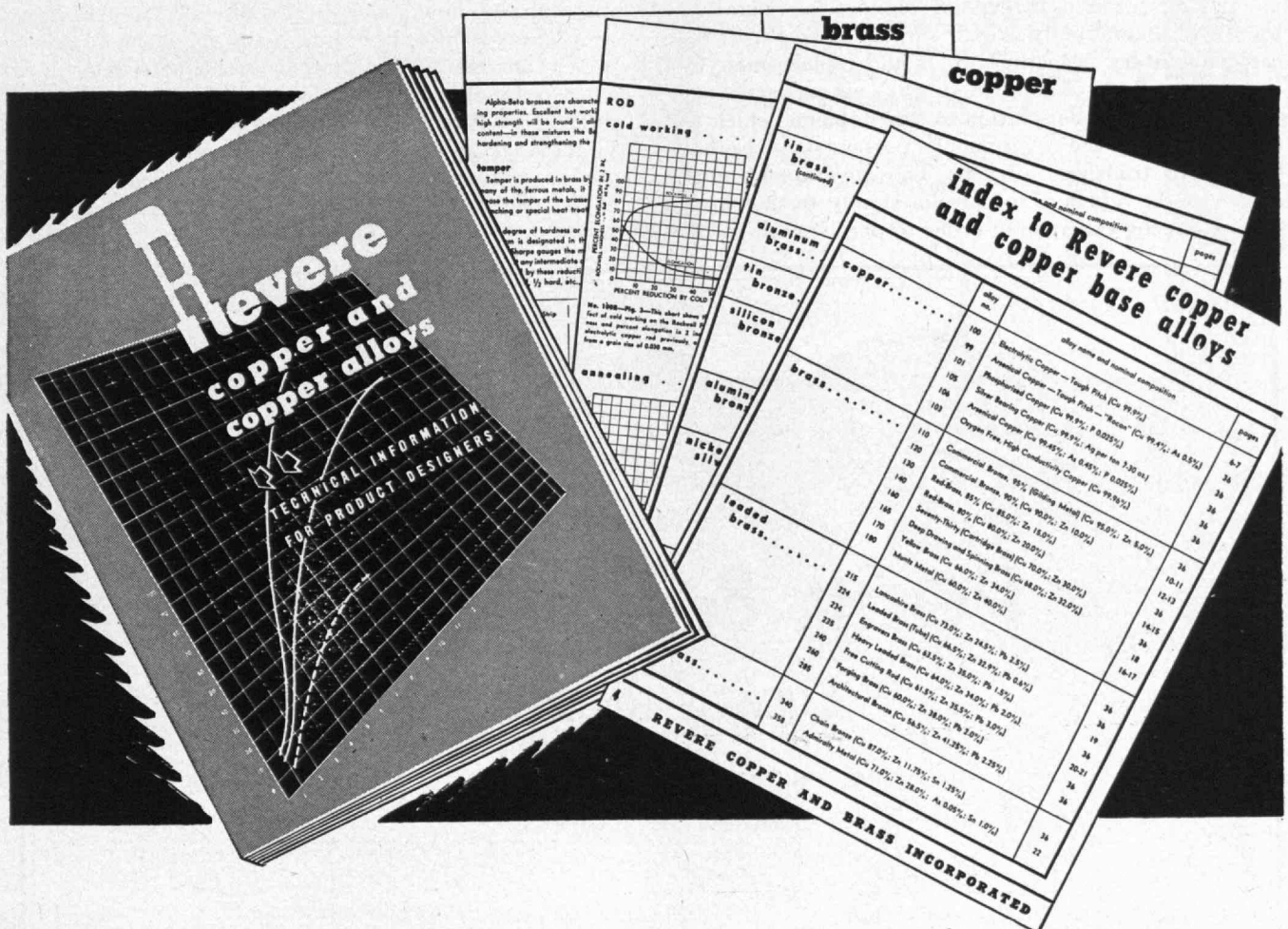
The chemical smoke-generator companies are able to get into operation quickly and effectively. Within a few minutes after a warning is given, clouds of smoke begin to billow over the point to be protected. Recently one of the companies stationed in North Africa was called upon to screen a newly captured port. Four minutes before the first wave of enemy bombers came over the port, the warning reached the company. Smokepots were lighted immediately on an inner line close to the target. Somewhat farther out, the M1 generators were put into operation. Hostile bombers came over in wave after wave in a raid that lasted nearly an hour. The target was so well covered that they did not score a single hit on the vital area, and no damage was caused. Operations of this sort successfully protected North African ports for weeks at a time, saving many hundreds of lives and untold property.

But the technical man was already working on an improved model before the reports came in from the field. The soldier is never completely satisfied and always demands still more mobility and portability. He is always seeking new uses for his tools of war. He found the mechanical cloud maker so effective for back areas that he tried it closer to the front. In the North African theater it was used to protect all sorts of military and naval installations. In that theater, however, the soldiers complained that this machine, made and intended for use around industrial centers and within the zone of the interior, wouldn't stand the gaff of active warfare. Then the complaint was that the machine was too big and cumbersome for protecting areas near the front. The result of the demand from the front is a new cloud maker, one-tenth the weight and size of the old one, and small enough to be carried on a jeep. This will make much more smoke, weight for weight, than even the M1.

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## TODAY'S AIRPLANES TOMORROW

*(Continued from page 89)*

can foresee the sort of world to come from the holocaust. A certain number of our surplus aircraft will have to be scrapped in any event. The close of war will find many of our air transports located at remote fields throughout the world. Overnight the standards by which aircraft are valued will undergo radical revision. No longer will many of these aircraft be in condition to meet the peacetime test of airworthiness. The cost of reconditioning and possible rebuilding plus the flight or shipment costs to a home base will have to be carefully measured against the plane's value there when the market has already become surfeited with similar equipment. No doubt a careful on-location survey of all war transport aircraft, in the light of various considerations of cost and value, should be undertaken as a first step, in order to determine what equipment is not worth reconditioning or salvaging.

Nevertheless, in addition to the equipment which is written off and destroyed and the equipment immediately needed to relieve the acute shortage of aircraft in commercial service and to expand commercial operations, there will undoubtedly exist a surplus sufficient to take care of military peacetime needs and replace manyfold the pre-war fleets of all of the world's air carriers.

There is no simple solution to the problems which will be presented by the government's possession of this huge balance of transport aircraft. The government might authorize the return of the surplus supply to the various manufacturing concerns in order to permit each factory

to convert its own type of aircraft to commercial usage and resell them under appropriate regulations calculated to prevent evils not now foreseeable. Obviously, this would be a vast and complex undertaking, and the disadvantages that would surely follow could well be greater than the disadvantages it was designed to avoid.

Or the government could enter upon a policy of preserving the surplus aircraft in a separate pool for use in any future contingency. Although commercially — where economy of operation is a controlling consideration — it is important to have the most modern and efficient types of aircraft, this is not a controlling factor when a period of national emergency is involved and operating cost is relatively unimportant. The establishment of such a reservoir would involve, of course, the building and maintenance of large storage facilities.

Far more realistic to my mind than any of the possibilities which I have mentioned or than any of the many others which could be suggested today is the proposal that adequate machinery be set up now to handle the problem in whatever way may best accord with the national interest and national policies at the time these matters must be decided. We do not know today how long the war will last; how many surplus aircraft we shall have; what kinds they will be; how many might be efficiently used by our own air lines; how many should be made available to foreign air lines; what special rehabilitation, emergency, or relief measures will have to be undertaken by these transport aircraft; how soon manufacturers can produce new and more modern types; how much charter or contract service will be undertaken at the end of the

*(Continued on page 100)*

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## TODAY'S AIRPLANES TOMORROW

(Continued from page 98)

war; what the international arrangements will be for controlling and regulating international air traffic; or what the volume of that traffic may be permitted to be. We do not know who will be in the aircraft manufacturing business or, for that matter, the answers to many other important questions which should be available in whole or in part when action is taken. Hence it would seem wise at the moment to devise such machinery as will permit all of these questions and their answers to be taken into consideration at the appropriate time so that wise national policies and conclusions can then be formulated and the appropriate action taken.

Bearing upon all these problems is the fact that unless considerable work is done toward the development of purely commercial aircraft prior to the close of hostilities, we can anticipate a period of from two to five years before new commercial types are available for the market. In the meantime, the needs of our civil air lines, of reconstruction and relief operations abroad, and of foreign countries will have to be met from war-produced aircraft even if they are not so efficient as the postwar aircraft industry will know how to build.

I may seem to have placed too little emphasis upon the construction of smaller types of aircraft and upon the problems which will confront the manufacturer of parts and accessories. The problems of these latter businesses are no less acute than are those of the transport-aircraft producer; but in a brief review it is necessary to concentrate on one branch. All branches of the flying-equip-

ment industry should receive the same careful attention in the determination of national policy.

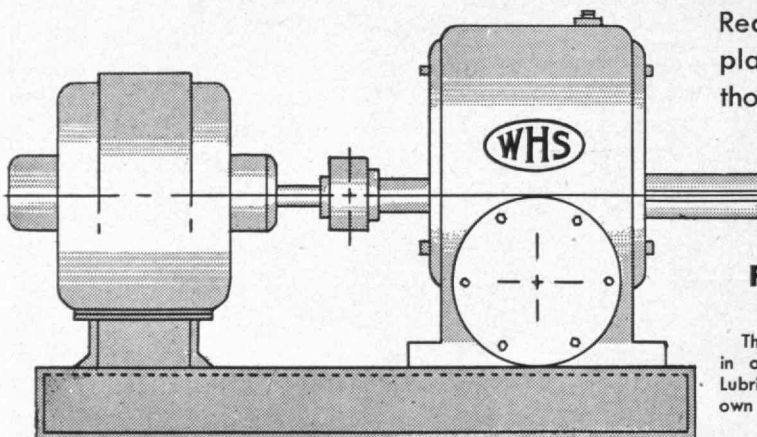
Exceedingly important is the question of how we can set up machinery which will place the government in a position to do what is necessary when the time comes. An aviation-conscious Congress, recognizing the problem, has before it House Bill 2959, which would provide such machinery. Introduced by Representative Clarence F. Lea of California, chairman of the House Interstate and Foreign Commerce Committee, this bill as presently constituted proposes to place in the Civil Aeronautics Board the responsibility for handling the surplus aircraft problem, and grants broad powers to the board in the disposition of surplus aircraft owned by the United States. In the process of disposing of all surplus equipment, the board will be required to weigh the effect of its policies on the economic soundness, efficiency, and safety of the existing domestic and international air transport system of the country. It is also charged with the burden of pursuing a course that will preserve the economic soundness of the aircraft-manufacturing industry.

Under the proposed measure, all Federal departments having ownership, possession, or control of surplus aircraft which were manufactured or in process of manufacture on or prior to the date one year following the cessation of hostilities are authorized to transfer such ownership, possession, or control to the board. From that point on, it becomes the board's responsibility to dispose of the surplus aircraft as it sees fit but in keeping with the policies set forth in the bill. The board is given wide latitude in the manner in which it chooses to dispose of

(Continued on page 102)

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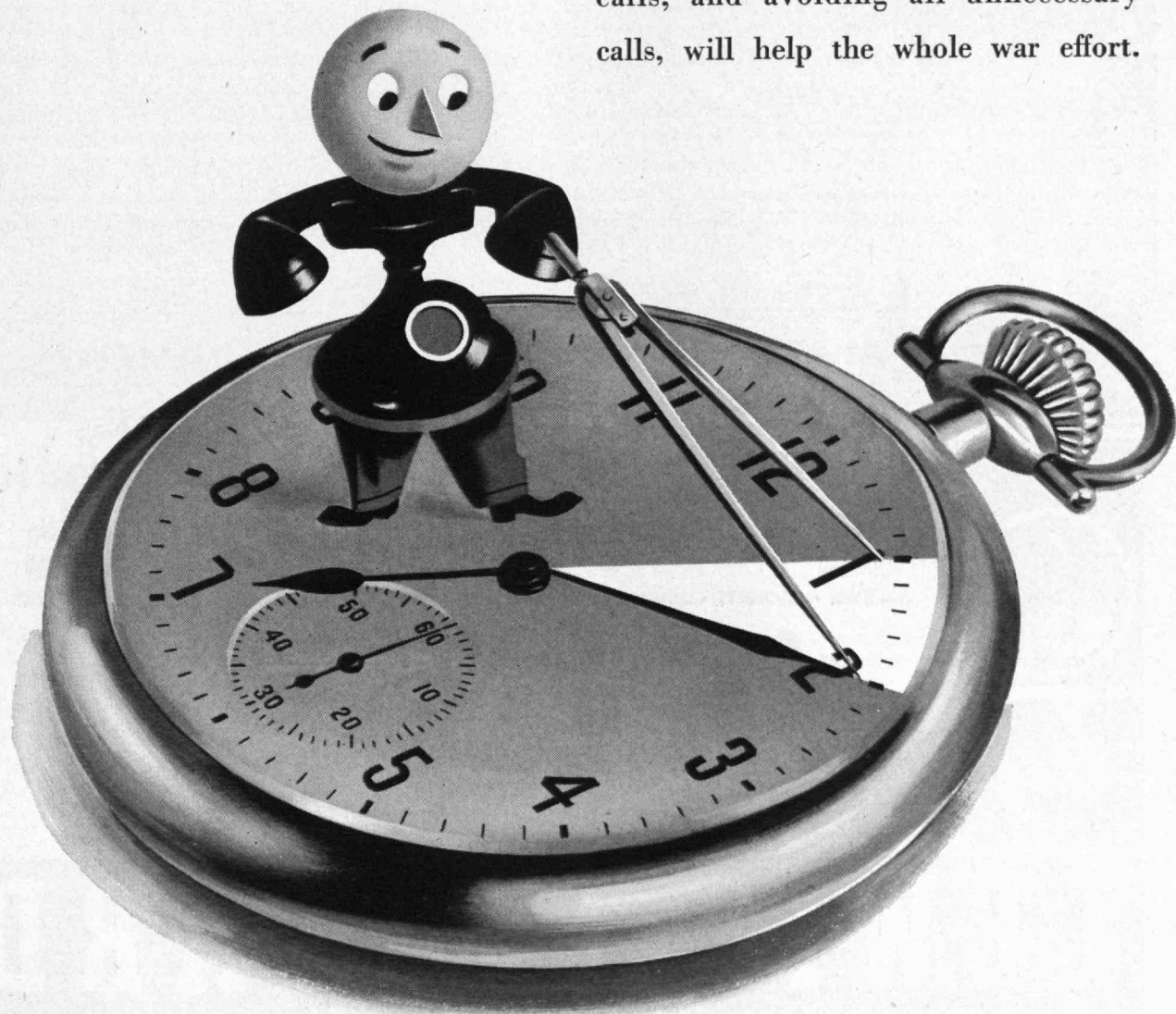
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## TODAY'S AIRPLANES TOMORROW

(Continued from page 100)

all surplus aircraft. It can sell, lease, charter, exchange, or otherwise dispose of aircraft and parts owned by it, with or without advertising and under such terms as it may determine. Further, it is not limited in the financial arrangements it may desire to make in accepting payment.

Obviously, the proposed legislation contemplates the conduct of individual business transactions by the government. From the nature of things, this is an inescapable consequence of the government's ownership of surplus aircraft in such quantity and in such circumstances that the immediate disposal of them at the war's end is out of the question. One should keep in mind that we are here dealing with public assets costing, perhaps, several billions of dollars.

The objectives of the bill are worthy, and I believe that the Civil Aeronautics Board, charged already with the duty and responsibility of fostering the sound development of an air transportation system, should have a large part to play in the disposition of the surplus aircraft. It is believed, however, that other departments of the government have vital concern in this disposition, and I am authorized to say that it is the board's view that the instrument for carrying out the provisions and intent of this bill should be a corporation, the board of directors of which should include representatives of the War Department, the Department of the Navy, the Department of State, the Department of the Treasury, the Department of Commerce, and the Civil Aeronautics Board.

This, then, is the machinery through which I believe the most satisfactory solution can be attained. If I seem to have raised large problems and indicated vast and complicated vistas without recommending any concrete solution, I have done so because no solution is possible today. The only great step which can be taken now is the establishment of the machinery for handling the problems to which I have referred. To me the taking of that step promptly is of the greatest importance.

The magnitude and complexity of the problems with which any agency set up to administer the surplus aircraft will be confronted must be clearly recognized. Even with the broad powers and the wide latitude of action contemplated in this pending legislation, such an agency will on occasion be faced inevitably with the necessity of choosing among several possible courses, none of which is wholly satisfactory. Only wishful thinking could lead to a conclusion that a reserve of several thousands of transport aircraft could be so administered that in any and every conceivable circumstance nothing whatever would be subtracted from the potential markets of the manufacturers. The mere existence of these aircraft in any capacity offers a dangerous degree of competition.

As has been pointed out, the pending legislation contemplates that the surplus aircraft will be maintained, administered, and liquidated in a manner to preserve the economic soundness of the nation's air-transport and aircraft-manufacturing industries. But neither the intent of Congress nor of the government agency which will have responsibility for the reserve could completely remove the threat to air-transport markets so long as the

(Concluded on page 104)



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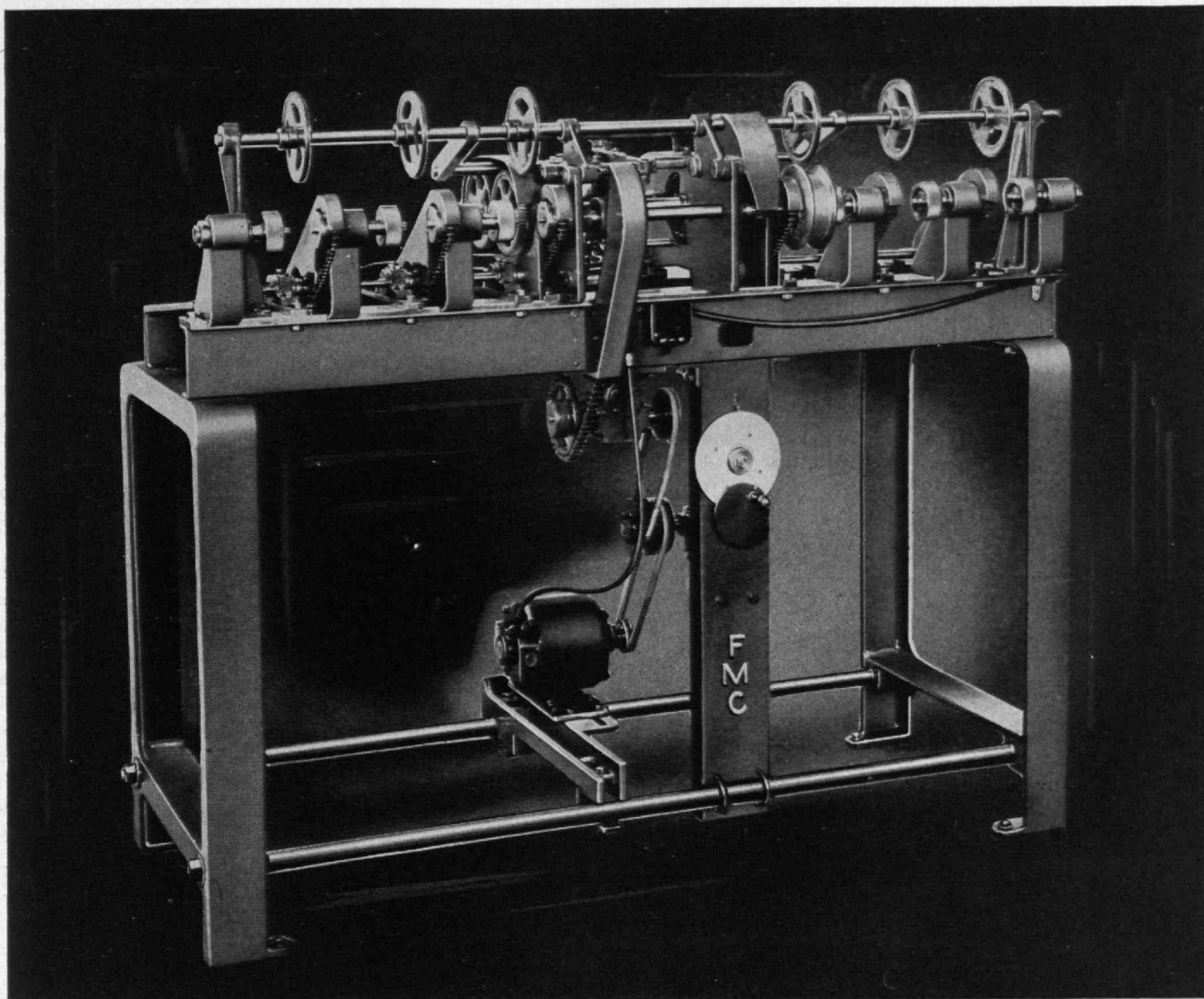
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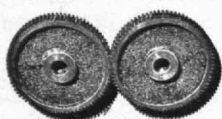
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## TODAY'S AIRPLANES TOMORROW

(Concluded from page 102)

aircraft which compose that reserve are on an approximate par of efficiency with aircraft in production by the manufacturers. If the end of this war finds the aircraft manufacturers limited to the capacity to grind out exact replicas of those aircraft of which a large surplus is already on hand, and finds them unable to place upon the market, soon after the war, aircraft which are appreciably more efficient for commercial service than those already on hand, then as a nation we shall have missed a great opportunity. The war may, of course, force us to miss it; let us hope not. The term "postwar planning" has a pleasantly reassuring sound. It brings to mind a picture of broad-scale blueprints of the future and other comprehensive activities. But I venture to assert that any postwar planning which does not provide for aggressive, practical application in the factories of this country just as soon as the war program permits is a form of self-delusion.

To find time and a way to launch and develop those activities which at the war's end will place our factories in a degree of readiness to produce what they *should* then be capable of producing is a matter of distinct national concern. To find time to develop new and better models of transport aircraft, ranging from small but efficient types suitable for local services, to large transoceanic air liners, is the problem. I have faith that if this problem can be worked out in harmony with the requirements of war production, our American manufacturers and airline operators need have little concern for the competition from postwar surpluses of war transport aircraft.

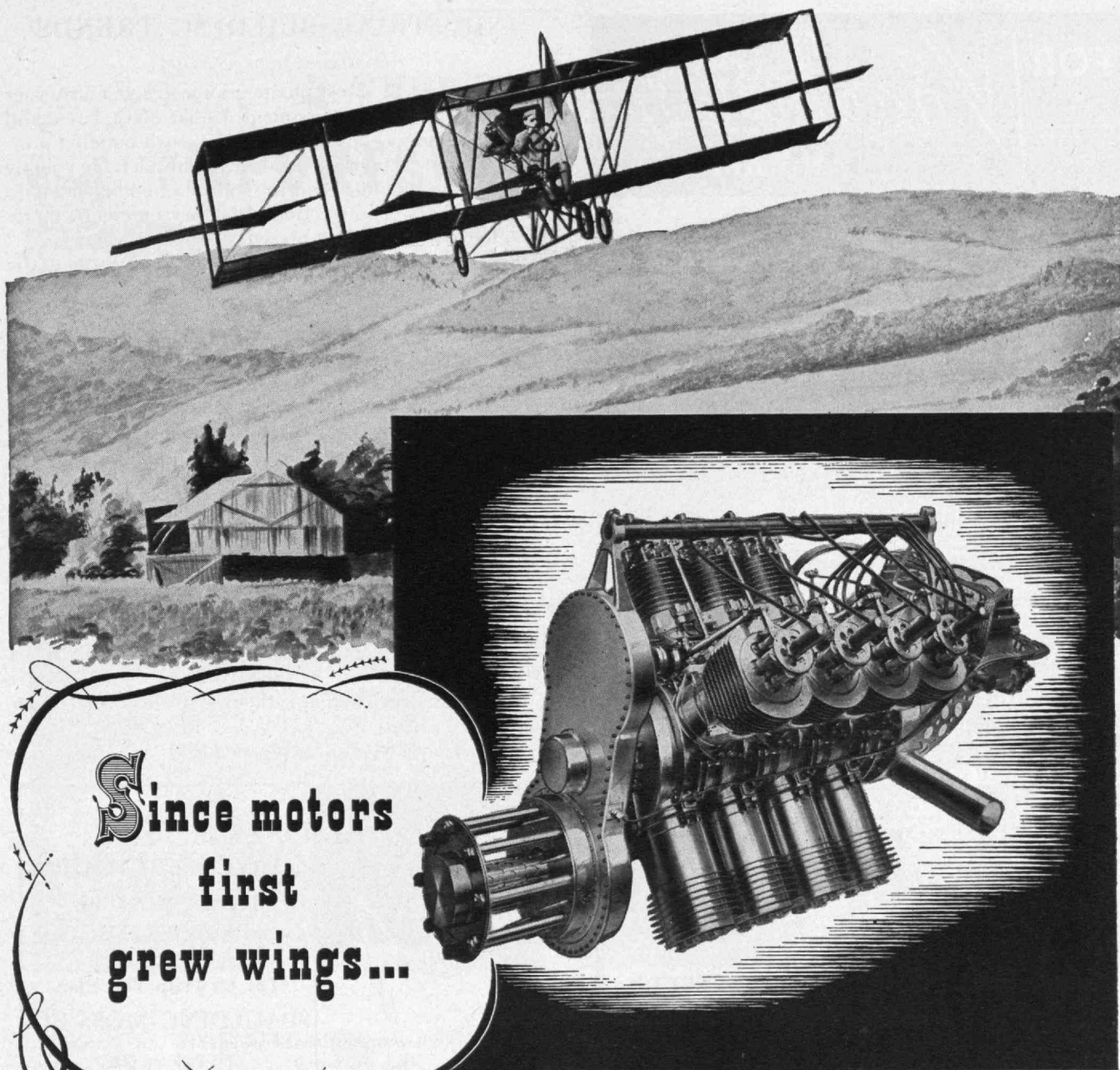
## INDUSTRIAL BUILDING TRENDS

(Continued from page 91)

erection of factory buildings than to that of either apartments or offices. Lofts, offices, and apartments are all erected for tenant occupancy. The building cycles for these structures have many common features: Building costs assume a much larger role in stimulating or retarding construction of such new buildings than is true with ordinary factory buildings. Industrial plants are merely means to an end, as owners expect their profit not from ownership of buildings but from manufacturing operations carried on within the buildings. Owners of lofts, offices, and apartments, however, seek their return from the net income derived from buildings; they have nothing to do with activities of tenants. The cost of such a building, together with the cost of land, constitutes practically the whole capital investment from which future income is to be derived. Abnormally high construction costs and high interest rates jeopardize the financial success of a tenanted building. The tendency is for these buildings to be erected, therefore, not only when both building costs and interest rates are low but when the vacancy rate is so low as to assure a sufficient rental to make construction profitable.

In contradistinction, the erection of new factory buildings is influenced by the earnings of an organization in its currently occupied plant, rather than by interest rates or speculative considerations. They are seldom erected for rental purposes, nor are they often built for

(Continued on page 106)



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## INDUSTRIAL BUILDING TRENDS

(Continued from page 104)

purposes of resale. Most plants are constructed for owner occupancy as a fixed investment. Unlike office, hotel, and apartment-house construction, where each building project is in most instances a new unit, a considerable volume of industrial building is in the nature of enlargement to existing plants. The erection of factory buildings, therefore, follows rather than precedes industrial earnings.

New plants are timed very largely with reference to the need for new productive capacity. Desire to reduce high unit costs also is a powerful factor in stimulating new construction. Pressure for new and larger buildings becomes particularly strong with the introduction of new technologies, whether they involve new processes, new materials, new products, new mechanical equipment, or new sequences in the scheduling of manufacture and assembly of merchandise through the plant. Since old concerns, in order to maintain a competitive position, must equip themselves with each new technological improvement as it is introduced, the construction of new industrial plants may at times be practically unrelated to the current level of profits. New construction may occur despite an excess of vacant factory space, if such space because of size, shape, location, or manner of construction is unadapted to the most efficient methods of manufacture.

Industrial organizations, then, build new or larger plants not when costs are low but when new or larger

(Continued on page 108)



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## INDUSTRIAL BUILDING TRENDS

*(Continued from page 106)*

quarters are needed. Factory buildings, though built as well as or better than residential buildings, are more vitally affected by technological changes, and, as a result, they are often withdrawn from use long before their full structural depreciation. The necessity for new factory buildings is often occasioned more by the changing technique in manufacture than by the pressure of increased demand for additional space.

Industries are of two types: (1) "basic," or primary, industries, which are devoted to manufacture of goods or rendering of services in interregional trade; and (2) secondary industries, which are engaged in production of goods or services for the community itself. Growth of secondary industries tends to follow population, and where these have reached a point of meeting current requirements of the community, future growth must be slow. These limitations do not apply, however, to basic industries, whose ability to expand is determined not by size of population but by the marginal competitive advantages possessed by local as against outside manufacturers in common regional markets.

The view so prevalent a few years ago that multi-story buildings are more economical than single-story buildings is no longer held by industrial engineers. First of all, multistory buildings are usually built upon more expensive land. Then, too, a multistory structure has considerable waste space, which would be economized for use in the single-story structure. Thus to serve the upper floors, a multistory building must have elevators, which necessitate shafts and walls to enclose them, not to mention the expense of operating the elevators. The upper floors must also have stairways and fire escapes. Higher walls involve either thicker walls or larger columns. Floors in single-story buildings, resting directly upon the ground, can as a rule carry any live-load weight, whereas in multistory buildings increased live-load requirements are reflected immediately in higher construction costs. The old idea that the smaller roof area in a multistory building effected such an economy in construction as to make the multiple-story building cheaper than the one-story structure has been shown to be erroneous, because the combined cost of the roof and of the floor resting upon the earth in the single-story building is less than the cost of the structural floor serving as floor and ceiling in the multistory building. The net result of these various economies is to make the cost per square foot of usable floor area approximately 25 per cent less than that of a five- or six-story building having the same gross floor area. In some lines of industry, whether land costs \$5,000 or \$50,000 an acre makes no difference — the one-story factory building is still the more economical.

When the price of land exceeds \$50,000 an acre — that is, about \$1.25 a square foot — the carrying charges become, because of increased investment, so heavy as to make one-story factory buildings uneconomical. This condition tends not so much to prompt the erection of multistory industrial buildings upon high-priced land in the central portions of cities as to encourage the migration of downtown plants to suburbs where they may obtain land at a sufficiently low price to permit erection of one-story buildings.

*(Continued on page 110)*



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## **INDUSTRIAL BUILDING TRENDS**

*(Continued from page 108)*

Other things being equal, industrial buildings situated on low-priced land are the more attractive investment. High land values add to interest, amortization, and taxes, thus increasing the cost of manufacture. They also constitute, in proportion to their amount, an increased threat to the stability of the real-estate investment of an organization. In times of depression, land values fall more rapidly than building values. A plant located on high-priced land in the heart of a city is, therefore, more vulnerable to a severe depreciation in land values than one located on low-priced land in the suburbs. In boom times, moreover, a plant located in the center of a city is more likely to experience an increase in the value of its land than is one located in the suburbs—a doubtful advantage since the increase is usually accompanied by higher taxation and cannot be realized, short of a sale and removal from the premises. Such conditions have, during the past few years, served to accelerate the industrial development of low-priced land in suburban communities.

Recognizing the fact that it is the part of wisdom to take the profits due to appreciation in land values, many organizations with plants on high-priced land have in an increasing degree disposed of downtown plants and, with the proceeds, erected plants on less expensive land in the suburbs or beyond the city. As a result, a valuable but nonproductive asset in high-value land may sometimes be converted into a more productive manufacturing plant possessing both lower unit costs and larger capacity. In other words, the organization sells an asset which, as a result of inflated land values, not only contributes nothing constructive to its purposes but saddles it with increased costs. With the funds realized from the sale, it is able to re-establish the business more firmly in a new locality. Under these conditions one need hardly be surprised that the central portions of cities are rapidly losing such industries as are not dependent upon the local market for the sale and distribution of products.

After studying building and equipment problems in order to try to increase flexibility of layout and operation so that proper balance will be maintained between departments, and to gear operations so that each will synchronize and mesh with the one preceding and succeeding it, some companies have found a smaller one-story building, incorporating modern conveniences, better suited to their requirements than a multistory building with from two to three times the same floor area.

By affording better control of each element entering into production, new buildings designed to meet requirements are effecting not only a substantial reduction in plant investment but an appreciable decrease in production costs. Hand in hand with these economies goes an improved quality of product, with less breakage, fewer rejects, and less waste. The profits to be derived from new buildings frequently enable an organization to write off the entire plant investment in from three to five years.

The modern industrial building is primarily a machine for the production of commodities. The column arrangement must fit the lines of machines, the receptacles for merchandise, and the handling of goods for packing and shipping. If bays are too big, excessive costs will be incurred in large columns and heavy steel framing. Then,

*(Concluded on page 112)*

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## INDUSTRIAL BUILDING TRENDS

(Concluded from page 110)

too, care must be taken not to diminish normal ceiling heights through the use of inordinately deep girders. At the same time, vibration under stress of heavy machines must be avoided through the provision of adequate load capacities and proper reinforcement.

The daylighting of one-story industrial buildings differs from that of the multistory lofts in that illumination of the central part of the building may be supplied through the roof by monitors, saw-tooth windows, or skylights, and the room area may be indefinitely extended in width as well as length and yet every part of the room will be supplied with adequate daylight. As a result of the high sill level of saw-tooths, monitors, and skylights, nearly all daylight reaching the working plane is from the higher angles of the sky. The illumination from such windows is, therefore, less subject to obstruction and shadows than that from ordinary vertical windows which receive a considerable proportion of their skylight from nearer the horizon. Concentration of a considerable area of glass in a given cross section permits a high intensity of illumination to be obtained throughout all interior portions of the building.

The stability of employment and pay rolls in a community depends upon the extent to which its investments in industrial plants and equipment are in low-cost capacity. Only localities possessing plants with the lowest unit costs can reasonably expect minimum irregularity in employment and pay rolls. It is here that the defense program, in providing a minimum of 500,000,000 square feet of competitive floor space in new industrial plants, constitutes a real challenge to cities in nondefense areas, particularly to cities with a considerable volume of space in obsolete structures. Presumably this new space will

be thrown upon the market for manufacturing and storage purposes after the war. It will prove especially available to plants producing goods for either a regional or a national market. How will the absorption of this space affect the industrial position of the many cities, particularly in New England and the North Atlantic States, having an undue proportion, if not nearly all, of their manufacturing space in 40-, 50-, and even 60-year-old plants?

This situation will present a problem to hundreds of communities. The advancement and even the maintenance of living standards rest upon the institution of all possible economy in the production and distribution of goods. These communities must, therefore, find some way early in the postwar period to equip local industries with as modern and efficient plants as are to be found in the defense areas. Otherwise they may face a major liquidation of factory employment and pay rolls.

The changes now occurring in the construction and location of manufacturing plants promise not only revolutionary changes in the industrial structure of each community but basic readjustments in the city plan. Indeed it may be a question whether, over the longer term, the consequences of new types of factory building may not be as important in the effect they will wield upon the physical organization and plan of communities as upon industry itself. So that the original efficiency of these new plants shall not be impaired, no less than that their relocation shall not prejudice the highest development of communities, their sites must be planned in the strictest harmony with the urban areas of which they are such an intimate part. In other words, the permanent usefulness of these new industrial plants calls for a more intelligent, effective, and broader regional control over the use of land than has heretofore characterized our planning policy.

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## THE TREND OF AFFAIRS

(Concluded from page 82)

It commenced the undertaking on the afternoon of February 20, when an Indian farmer working in his cornfield near the town of Parícutin, about 330 miles from Mexico City, felt the ground begin to shake, heard deep subterranean rumblings. Smoke began to rise from a small depression in the field. Dirt and rocks were spewed forth from beneath the smoke. The farmer left for town. Today, his field is occupied by an active, growing volcano some 1,000 feet high and about 3,000 feet through at the base. Two near-by towns have been rendered virtually uninhabitable by its ministrations, which have covered the ground for miles around with a layer of ash and cinders. Five miles away, the layer is still about a foot thick. Dust from the volcano has been collected in Mexico City.

Called Parícutin, this energetic infant is not only, like all new volcanoes, a geological rarity but is also one of the very few which have been continuously observed from the start by informed personnel. As Mexican volcanoes go, it is comparatively accessible, being situated near one of the principal highways of the region so that, in the early stages, spectators could drive their cars almost to the foot of the cone. Although it has not attracted so much attention from scientists or laymen as would be expected in normal times, the volcano early became somewhat of a tourist item. Nothing startling to geologists has been observed, however. Parícutin displays the usual spectacular symptoms, but is disappointingly conventional in its characteristics. The great masses of dust and gas released, the rapid growth of the cone (starting from a flat field, it reached a height of 180 feet in its first four days), the steepness of its sides, the lightning playing in the black column of smoke above the crater — all are typical volcanic phenomena.

Formed by the falling back of rocks and cinders thrown up from the vent, volcanic cones tend to be symmetrical. The slope of the cone depending on the angle of repose of the dry material or on the angle of flow of viscous lava, the sides are apt to be steep, as is true of the Mexican newcomer. When the lava is exceptionally fluid, however, volcanoes can have very flat and massive profiles. Mauna Loa, one of the five giant volcanic mountains which compose the island of Hawaii, is over 13,000 feet high and from 50 to 75 miles broad at its base.

Michoacán, the state in which the farmer's cornfield bore this unusual crop, is dotted with scores of similar cones, many of very recent origin, geologically speaking: One of them appeared not long after the Spaniards had entered this region.

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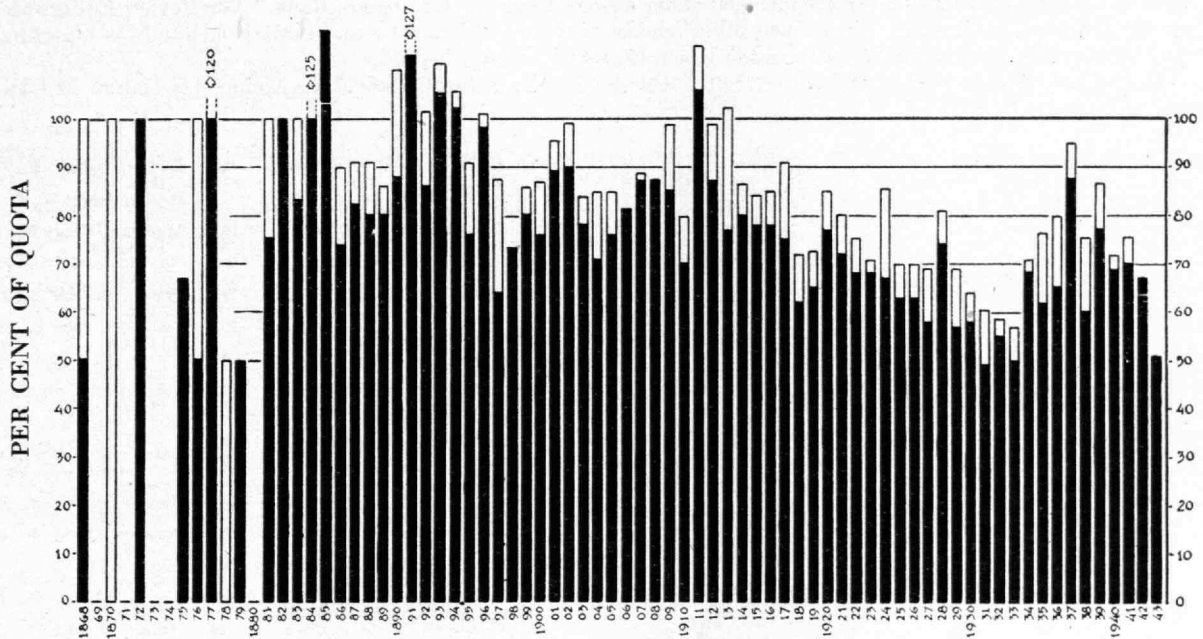
*AN AID TO ALUMNI IN FINDING DESIRABLE POSITIONS*

# TECHNOLOGY MEN IN ACTION

THE ALUMNI FUND — ITS PROBLEMS AND GROWTH

## THE FUND — AN INTERIM REPORT

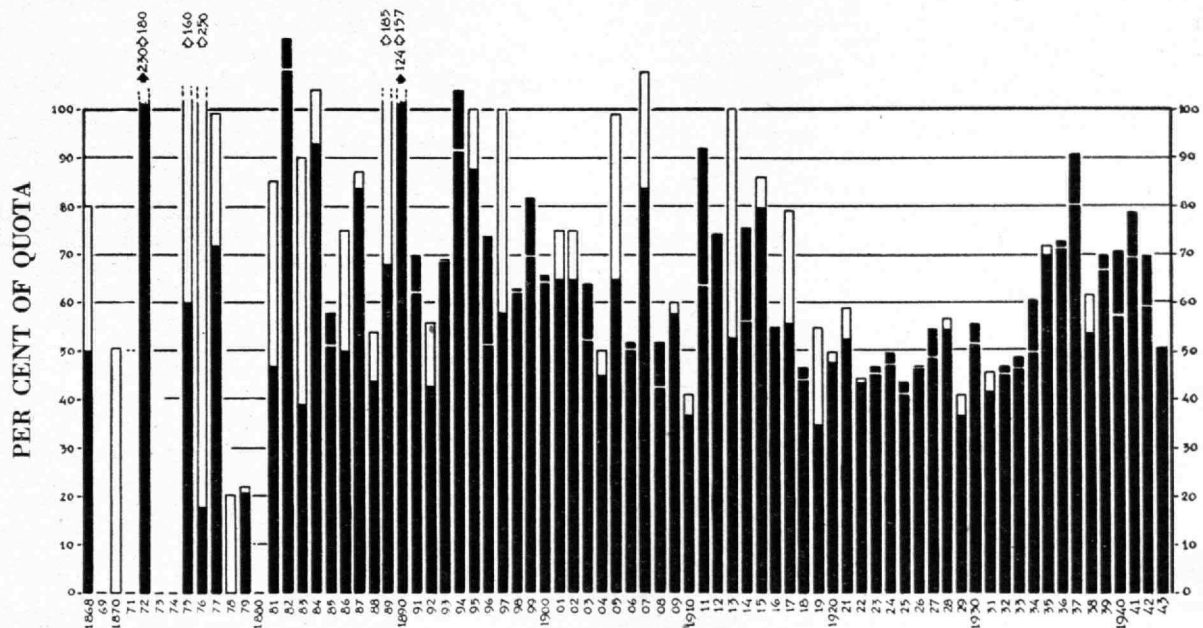
ON October 30, the seventh month of the 1943-1944 Alumni Fund came to an end. Although there are still five months to go, we can now get a rather clear picture of the direction in which the Fund is headed. By that date, almost 300 more men had given than at the same time last year, and the total of their contributions exceeded last year's October 30 total by nearly \$12,000. This is encouraging progress — but it is still not our goal of 10,000 men giving \$150,000. If all of last year's contributors should join again in this, the fourth year of the Fund, a very few "new" givers would be needed to achieve at least one of our objectives. If you have not yet contributed, won't you do so now?



CONTRIBUTORS BY CLASSES

Black: As of October 30, 1943. White: Last year's final figure

Here's the way the classes had responded by October 30. Figures are per cent of quota compared with last year's final percentages. Quota equals one-third of all living members of the Class. Note that '85 and '42 are already ahead of last year, and that '85, '91, '93, '94, and '11 have topped 100 per cent. That's good!



AMOUNT BY CLASSES

Black: As of October 30, 1943. White: Last year's final figure

And here are the amounts in per cent of quota compared with last year's final figures. Thirty-one classes are now ahead of their last year's totals; four ('72, '82, '90, and '94) are over the top. Congratulations!



# TECHNOLOGY MEN IN ACTION

## M.I.T. MEN AT WAR

Up to October 26 over 5,000 Institute Alumni, including 16 Admirals, one Commodore, and 61 Generals, were recorded as being in the active military or naval services of the United Nations. New additions to the list of Alumni in the High Command include Rear Admiral Henry M. Mullinnix '23, Brigadier General William R. Nichols '10, Brigadier General Edward Montgomery '12, Brigadier General James B. Newman, Jr., '21, Brigadier General John H. Hinds '23. To date 38 Alumni have received military decorations.

Beginning with the November, 1942, issue, The Review has included a listing of "M.I.T. Men at War." Corrections and additions to this list will be published in future issues. As a matter of convenience, promotions and corrections in the rank previously given are included under a single heading "Changes in Rank." The Review Editors are greatly indebted to the many Alumni and other readers who are continuing to co-operate so helpfully in reporting inevitable errors of omission and commission which they note in these listings.

Alumni are urged to write to their friends in the services. Letters addressed care of the Alumni Association, M.I.T., will be forwarded.

### NEW DECORATIONS

- 1927 Auchincloss, Samuel S., *Col.*, U.S.A., Silver Star for gallantry in action near Buna in New Guinea on December 29, 1942.
- 1936 Cohen, Leonard P., *Maj.*, U.S.A., Legion of Merit for outstanding achievement in meteorology.
- 1938 Guttell, John, *Lt.*, U.S.A., Air Medal for gallantry in action in the South Pacific.
- 1941★ Doughten, William S., *Lt.*, U.S.A., Purple Heart, posthumously; killed in Sicily, July 10, 1943.
- 1943\*\* Hartvig, Douglas M., *Lt.*, U.S.A., Two Oak Leaf Clusters, Air Medal, and the Purple Heart; wounded in Tunisia.

### NEW LISTINGS

#### U.S.A.

- 1921 Campbell, W. Elmer, *Capt.*, Lloyd, Leon A., *Maj.*
- 1922 Lappin, C. Roger, *Maj.*, Thomas, Earl R., *Lt. Col.*
- 1924 Liebman, Henry, *Maj.*
- 1925 Gruber, Philip E., *Maj.*
- 1926 Speert, Julius L., *1st Lt.*
- 1928 Milair, Norbert M., *Sgt.*
- 1929 Mason, Fred E., *Capt.*, Roman, Arnold G., *Lt.*
- 1932 Saltonstall, Nathaniel, *Capt.*, Speir, Frank W., *Capt.*
- 1934 Lindsey, Wilton J., *Lt.*, Milburn, John D., *2nd Lt.*, Montant, Louis T., *Lt.*
- 1936 Beckman, Ronald E., *1st Lt.*, Carroll, Daniel R., *Capt.*, Reday, Ladislav, *1st Lt.*, Davis, Walter B., *2nd Lt.*
- 1937 Dolben, Arthur J., *Pvt.*, Fitzgerald, John P., *Pvt.*, Laus, Andre N., *Pvt.*, Toyli, Matthew H., *M. Sgt.*
- 1938 Guttell, John, *Lt.*, King, Paul J., *2nd Lt.*
- 1939 Bayer, Joseph, *T.5*, Reed, Harlow J., *2nd Lt.*, Walker, William C., *Pvt.*
- 1940 Evans, John H. V., *Lt.*, Knowland, Raymond S., *Pvt.*, MacLeod, Ian M., *Lt.*
- 1941 Aaron, John B., *A.C.*, Baade, William H., *Pvt.*, Beard, Bruce, *1st Lt.*, Bergantz, Joseph A., *Capt.*, Bises, George R., *Pvt.*
- 1942 Blaustein, Ernest H., *Corp.*, Drennan, Leonard, *1st Lt.*, Magdsick, Charles D., *2nd Lt.*
- 1943 Angell, Burton S., *2nd Lt.*, Batiuchok, Andrew, *A.C.*, Bennett, Thomas M., *Lt.*, Boland, Vincent F., *Jr.*, *Pvt.*, Bonham, Carlos W., *1st Lt.*, Bowen, Russell J., Broderick, James C., Crawford, David J., *Pvt.*, Dunbar, Edwin S., *Jr.*, *Lt.*, Fiore, John M., Haas, Richard H., *A.C.*, McDonough, James O., *O.C.*, Mackenzie, John B., *Pvt.*, Nieder, Bailey H., *O.C.*, Scharff, Samuel A., *O.C.*, Train, Wesley H., *Lt.*, Wheeler, John T., Wyatt, Harold W., *Pvt.*

#### U.S.N.

- 1925 Chapline, George F., *Comdr.*
- 1930 Dolloff, Norman H., *Lt. (j.g.)*
- 1931 Cook, J. Franklin, *Lt. (j.g.)*, Mason, Carrington, *Lt. (j.g.)*
- 1932 Hiscock, Earle, *Lt. Comdr.*, Lawsine, Leo J., *Lt. (j.g.)*
- 1933 Balboni, Louis P., *Lt. (j.g.)*, Chapman, Dorothy A., *Ens.*
- 1934 Bencks, A. Paul, *Jr.*, *Lt. (j.g.)*, Dobbins, William E., *C.M.2c*, Everett, William W., *Jr.*, *Lt. (j.g.)*, Foote, Wilbur P., *Lt. (j.g.)*, Lucas, Edmund D., *Jr.*, *Lt.*, O'Brien, Robert A., *Lt. Comdr.*
- 1936 Easton, Harry T., *Jr.*, *Ens.*
- 1937 Pearson, Carl A., *Ens.*
- 1939 Shubart, Harry S., *Ens.*, Stephens, Herbert L., *Ens.*, Davison, William P., *Lt. (j.g.)*
- 1940 Karp, Daniel S., *Lt. (j.g.)*, Smith, Edward H., *Lt.*
- 1941 Engelman, Richard H., *Lt.*, Palmer, George H., *Jr.*, *Ens.*
- 1942 Coe, Jerome T., *Ens.*
- 1943 Adams, Robert W., *Ens.*, Brown, Cyril H., *Ens.*, Clark, Walter L., *III*, *Ens.*, Coles, Charles F., *Ens.*, Coughanour, Leslie W., *Ens.*, Dixon, Harry M., *Ens.*, Ferris, Henry D., *Ens.*, Floyd, George F., *Jr.*, *Ens.*, Frederickson, Aram F., *Ens.*, Graheek, Billy J., *Ens.*, Hartman, Orvis B., *Ens.*, Hartvig, Douglas M., *Lt.*, Holt, Frederick S., *Ens.*, Kimball, Allyn W., *Jr.*, *Ens.*, Polley, Philip E., *A.M.M.2c*, Schede, Robert W., *Ens.*, Shackelford, John C., *Ens.*, Slifer, George A., *Jr.*, *Ens.*, Swinton, David B., *Ens.*, Upham, Jay L., *Jr.*, *Ens.*

#### U.S.C.G.

- 1934 Burroughs, John, II, *Lt. (j.g.)*

#### U.S.M.C.

- 1943 Byloff, Robert W., *2nd Lt.*, Sledd, Marvin B., *2nd Lt.*

### OTHER UNITED NATIONS

#### CANADA

#### Army

- 1936 Laflamme, Jacques K., *Flight Officer*
- 1939 Weathersbee, Rodney D. J., *Capt.*

### CHANGES IN RANK

#### U.S.A.

- 1910 Nichols, William R., *Col. to Brig. Gen.*
- 1912 Montgomery, Edward, *Col. to Brig. Gen.*
- 1920 Lawson, Charles J., *Maj. to Lt. Col.*
- 1921 Baish, Charles F., *Maj. to Col.*, Lull, George F., *Brig. Gen. to Maj. Gen.*
- 1922 Newman, James B., *Jr.*, *Col. to Brig. Gen.*
- 1923 Howe, Paul C., *Maj. to Lt. Col.*, Hinds, John H., *Capt. to Brig. Gen.*
- 1925 Howard, Thomas L., *Capt. to Maj.*, Taylor, Galen M., *Capt. to Col.*

† Missing in Action.

- 1926 Bates, Joseph D., Jr., *Capt. to Maj.*
- 1927 Andrews, Elmer, *Capt. to Maj.*, Burton, Albert H., *Maj. to Col.*
- 1931 Andelman, Marshall E., *Pvt. to Lt.*, Heffernan, Edward M., *Lt. to Capt.*
- 1932 Finnerty, John A., *Lt. to Capt.*, ★ Parks, Gordon K., *Maj. to Lt. Col.*
- 1933 West, Thomas, *Pvt. to A.C.*, MacDonald, Hugh W., *Maj. to Lt. Col.*
- 1934 Manley, Kirtland, *Pvt. to Corp.*, Frank, Louis, *Capt. to Maj.*, Jenkins, Francis G., *Capt. to Maj.*
- 1935 Skinner, Leslie A., *Maj. to Col.*, Barber, Edward, *Maj. to Brig. Gen.*
- 1936 Root, Darrell A., *Capt. to Maj.*, Scribner, Robert A., *Lt. to Capt.*, Young, Frederick R., *Capt. to Lt. Col.*
- 1937 Cohen, Leonard P., *Lt. to Maj.*, Estabrook, Vincent T., *Lt. to Capt.*, Lacey, Julius K., *Maj. to Col.*, Lach, Michael J., *Lt. to Capt.*, Shott, Kathleen V., *3rd Officer to 1st Lt.*
- 1938 Downing, Ellsworth B., *Lt. to Lt. Col.*, ★ Gander, John H., *Capt. to Maj.*, Wood, Floyd B., *Capt. to Col.*
- 1939 Burke, Theodore E., *Lt. to Capt.*, Gunkel, Kenneth M., *Capt. to Maj.*, Phinizy, W. Harrison, *Lt. to Capt.*, Graffeo, Alphonse J., *Lt. to Capt.*, Harvey, Raymond J., *Capt. to Lt. Col.*
- 1940 Lampert, James B., *Lt. to Lt. Col.*, Ackerson, Alfred N., *A.C. to 2nd Lt.*, Castle, Alfred E., *1st Lt. to Capt.*, Graham, Harold, *2nd Lt. to Capt.*, Parent, Robert A., *Capt. to Maj.*, Taylor, William R., *Jr.*, *Lt. to Maj.*
- 1941 Tower, Sargent N., *Cadet to Capt.*, Weinbrenner, George R., *Capt. to Col.*, Wood, Charles H., *Capt. to Lt. Col.*
- 1942 Butt, William T., *Lt. to Capt.*, Horton, Peter, *Lt. to Capt.*, Langworthy, Richard E., *Lt. to Capt.*, Moxon, George W., *Lt. to Capt.*, Mueller, Carl M., *Lt. to Capt.*, Muller, Charles J., *Jr.*, *Lt. to Capt.*
- 1943 Buford, Curtis D., *Lt. to Capt.*, Carrington, Thomas R., *Jr.*, *2nd Lt. to Capt.*, Crowley, Thomas, *1st Lt. to Capt.*, Heldenfels, Richard R., *Lt. to Capt.*, Saylor, Harlan K., *2nd Lt. to Capt.*, Slocum, Michael D., *2nd Lt. to 1st Lt.*, Wood, Harry P., *A.C. to Lt.*, Spindel, Fritz, *Sgt. to M. Sgt.*

#### U.S.N.

- 1917 Thomson, Gerald W., *Comdr. to Capt.*

- 1920 Dudley, Sidney E., *Comdr. to Capt.*, Hayler, Robert W., *Lt. Comdr. to Capt.*
- 1923 Mullinnix, Henry M., *Comdr. to Rear Adm.*
- 1923 Nowell, Joseph C., Jr., *Lt. to Comdr.*
- 1924 Brewer, Samuel B., *Comdr. to Capt.*
- 1925 Ostrander, John E., Jr., *Comdr. to Capt.*
- 1927 Turner, Richard C., Jr., *Lt. to Lt. Comdr.*
- 1928 Bell, Robert C., Jr., *Lt. Comdr. to Comdr.*, Sanborn, Alden R., *Lt. Comdr. to Capt.*
- 1929 Hatcher, Robert S., *Lt. to Capt.*
- 1931 Rodgers, James H., *Lt. Comdr. to Comdr.*
- 1932 Hinnera, Robert A., *Lt. Comdr. to Comdr.*
- 1934 Mooney, David A., *Lt. to Lt. Comdr.*
- 1935 Gluntz, Marvin H., *Lt. to Lt. Comdr.*
- 1937 Knapp, George O., *Lt. to Lt. Comdr.*
- 1940 Dodson, Joseph E., *Lt. to Lt. Comdr.*
- 1941 Chandler, Cedric L., *A.S. to R.T3c*
- 1942 Avent, Arthur W., *Ens. to Lt. (j.g.)*, Greenberg, David F., *Ens. to Lt. (j.g.)*, Minevitch, Lisa, *A.S. to Ens.*, Reed, Mortimer P., Jr., *Ens. to Lt. (j.g.)*
- 1943 Walker, Malcolm C., *Mid. to Ens.*

#### U.S.C.G.

- 1940 Berger, Louis, *Ens. to Lt. (j.g.)*

#### U.S.M.C.

- 1940 Erickson, M. Richard, *Lt. to Capt.*

### RANK NOT PREVIOUSLY PUBLISHED

- 1934 McAvoy, William J., *Lt. (j.g.)*, U.S.N.
- 1942 Hull, Arnold R., *Capt.*, U.S.A., McNeal, Daniel R., Jr., *Ens.*, U.S.N.
- 1943 Root, John D., *1st Lt.*, U.S.A., Harno, Albert J., Jr., *Ens.*, U.S.N., Heller, Steven, *2nd Lt.*, U.S.A., Lee, Munny Y. M., *O.C.*, U.S.A.

### CASUALTIES

- 1919 ★ Morrison, Robert F., *Lt. Col.*, U.S.A.; October 16, 1943.
- 1932★ Parks, Gordon K., *Lt. Col.*, U.S.A.; South Pacific, October 8, 1943.
- 1937 ★ Gander, John H., *Maj.*, U.S.A.; October 10, 1943.
- 1941 † Jerome, Frank J., III, *Lt.*, U.S.A.; September 29, 1943.
- 1942 ★ Leiserson, Charles F., *Ens.*, U.S.N.; plane crash, September 20, 1943.
- 1943★ Mank, Matthew, *Sgt.*, R.C.A.F.; April 15, 1943.

★ Killed in Action.

\* Died in Service.

\*\* Wounded.

## ALUMNI AND OFFICERS IN THE NEWS

## Applause

¶ For CHARLES-EDWARD A. WINSLOW '98, who spoke on "Public Health in the Soviet Union," at a conference sponsored by the National Council of American-Soviet Friendship in New York City on November 7.

¶ For JOHN E. BURCHARD '23, who spoke on "Better Homes to Come with Better Houses," at a meeting of the Radcliffe Club of Boston at the Houghton Library of Harvard University on October 26.

¶ For LESLIE B. BRAGG '25, who addressed the Charleston, W. Va., section of the American Institute of Chemical Engineers in October. Mr. Bragg spoke on "Packed Distillation Columns."

¶ For HARLAN T. STETSON, guest of the Institute, who lectured on "The Earth and the Sun, from Copernicus until To-morrow," to commemorate the 400th anniversary of Copernicus, at Colby College on October 22. Dr. Stetson also addressed the college assembly on "Science During the War and After."

## Congratulations

¶ To FREDERIC H. SEXTON '01, who on the King's birthday was awarded the civilian honor of Commander, Order of the British Empire.

¶ To WILLIAM C. LOUNSBURY '03, who has been appointed chairman of the executive safety committee of the Duluth Chamber of Commerce for 1943-1944.

¶ To JAMES I. BANASH '06, who is on the executive committee of the engineering section of the American Society of Safety Engineers. Mr. Banash is a past general chairman of the section.

¶ To DENISON K. BULLEN '09, who has been made a member of the advisory board of the Philadelphia Ordnance District of the United States Army.

¶ To HERMANN BEHR '10, who is on the executive committee of the engineering section of the American Society of Safety Engineers. Mr. Behr represents the Boston chapter.

¶ To JEROME C. HUNSAKER '12, who received the honorary degree of doctor of science at the sesquicentennial commencement of Williams College.

¶ To JONATHAN A. NOYES '12, who has been named vice-president of the American Society of Mechanical Engineers.

¶ To OSCAR S. COX '27, who is to be general counsel for the new government agency, the Office of Foreign Economic Administration.

¶ To PARRY MOON '27 and DOMINA E. SPENCER '39, who have reported to the Optical Society of America their new yardstick of color harmony. The yardstick, known as the "aesthetic measure in color harmony," is expected to be of many important uses in every sphere of color and art. The new system developed by Dr. Moon and Dr. Spencer will make possible scientific ratings of the matchings of colors in any design from the point of view of the power of the design to give pleasure to human beings.

## Receiving Royalties

¶ GELETT BURGESS '87, on *Ladies in Boxes*, Alliance Book Corporation; and, with E. M. Butterfield, on the *Goop Song Book*, Willis Music Company.

¶ ARTHUR A. SHURCLIFF '94, on *Second New England Journal*, Old Corner Book Store.

¶ ROGER W. BABSON '98, on *Looking Ahead Fifty Years*, Harper; and on *The Open Church Door*, Andover Newton Book Store.

¶ MERLE RANDALL '12, with L. E. Young, on *Elementary Physical Chemistry*, Randall and Sons.

¶ WILLIAM H. McADAMS '17, on *Heat Transmission*, second edition, McGraw-Hill.

¶ W. RUPERT MACLAURIN and CHARLES A. MYERS, staff, on *The Movement of Factory Workers*, Wiley.

## Designs for Postwar Living

¶ IBOH MING PEI '40 and E. H. Duhart won second prize in a competition for "designs for postwar living," sponsored by *California Arts and Architecture*, and cosponsored by many industrial firms. Mr. Pei and Mr. Duhart designed a house for a "typical worker in the postwar period." LOIS WILSON LANGHORST '40 and ARNOLD WASSON-TUCKER, former staff, received honorable mention in the contest.

## Under the Magazine Covers

¶ By WILLIAM D. COOLIDGE '96, "Peacetime Salvage from Wartime Research," *Tech Engineering News*, October. Dr. Coolidge was chosen as T.E.N.'s alumnus of the month.

¶ By EDGAR A. WEIMER '98, "Dikes and Dams," *American Engineer*, October.

¶ By FRANCES R. WILLIAMS '04, "Drying Plants in Three Dimensions," *Museum News*, November 1.

¶ By PHILIP C. JONES '12, "Multi-vibrators," *Bell Laboratories Record*, September. Mr. Jones is associate editor of the *Record*.

¶ By FREDERICK J. GIVEN '19, "Mica for War Purposes," *Bell Laboratories Record*, October.

¶ By JOSEPH MANUEL, JR., '25, "Quality Control," *Tech Engineering News*, October.

¶ By SAMUEL B. ZISMAN '30, "Cities in Action: Corpus Christi [Texas] and its New Seven-League Boots," *Survey Graphic*, October.

¶ By HSU-YUN FAN '34, "Thermionic Emission from an Oxide-coated Cathode," *Journal of Applied Physics*, October.

¶ By DONALD S. TUCKER, staff, "Which Industry to Choose," *Mechanical Engineering*, October.

## DEATHS

\* Mentioned in class notes.

¶ MAXIMILIAN AGASSIZ '84, September 21.

¶ FREDERIC M. STUART '84, October 4.

¶ ERNEST B. MOORE '88, May 1.\*

¶ CHARLES G. RICE '88, July 29.\*

¶ CLARENCE G. NORRIS '89, August 1.\*

¶ OSCAR W. PICKERING '89, August 31, 1942.\*

¶ CLARENCE A. MOORE '99, October 4.

¶ ROY H. BOLSTER '01, September 8.\*

¶ EDWIN P. BURDICK '01, March 21.\*

¶ WALTER A. READ '01, April 30.\*

¶ SIDNEY Y. BALL '03, September 10.

¶ ROBERT A. HUBBARD '04, October 14.

¶ EDWARD B. RICH '04, May 9.

¶ RUTH O. PIERSON '09, September 12.\*

¶ JOHN W. HINES '14, September 30.\*

¶ EDWARD SCHOEPPE '15, October 18.\*

¶ OSCAR S. MARTINSON '19, 1942.\*

¶ ALBERT V. SMITH '20, October 8.\*

¶ J. LEWIS HURLEY '21, October 14.\*

¶ ALBERT I. GOULD '23, January 8.\*

¶ PAUL F. ECKSTORM '30, July 6.

¶ GORDON K. PARKS '32, October 8.\*

¶ JOHN H. GANDER '37, October 10.\*

¶ WILLIAM S. DOUGHTEN '41, July 10.\*



## NEWS FROM THE CLUBS AND CLASSES

## CLUB NOTES

*Metals Luncheon*

Following the annual custom, the M.I.T. Alumni attending the National Metal Congress in Chicago got together for luncheon at the Palmer House on October 21. The members present from the Institute were Carl F. Floe '35, Associate Professor of Physical Metallurgy, and Paul Gordon '40. Unfortunately, Dr. Floe had to leave the meeting early to catch a train, but he was able to give a short talk enlightening those present on the latest developments at M.I.T. Following is the list of those present: Paul A. Cushman '11, McGill Manufacturing Company, Valparaiso, Ind.; George A. Chutter '21, Hevi Duty Electric Company, New York, N.Y.; Harold E. Koch '22, Hevi Duty Electric Company, Milwaukee, Wis.; Frank D. O'Neil '25, Western Foundry Company, Chicago, Ill.; Harold L. Geiger '28, International Nickel Company, Chicago, Ill.; Edward Hartshorne '28, Western Cartridge Company, East Alton, Ill.; Thomas G. Harvey '28, Monarch Steel Company, Indianapolis, Ind.; George N. Wedlake '28, Cockshutt Plow Company, Ltd., Brantford, Ontario; Allen G. Shepherd, Jr., '30, Taft-Peirce Manufacturing Company, Woonsocket, R.I.; Howard B. Huntress '31, Wickwire Spencer Steel Company, Palmer, Mass.; Harry L. Moore, Jr., '32, National Refining Company, Cleveland, Ohio; Bruno H. Werra '32, Hevi Duty Electric Company, Milwaukee, Wis.; Robert G. Seyl '33, Continental Can Company, Chicago, Ill.; Albert M. Talbot '34, International Nickel Company, Bayonne, N.J.; Carl F. Floe '35, M.I.T., Cambridge, Mass.; Morton M. Jenkins '35, Pittsburgh Forgings Company, Coraopolis, Pa.; John J. Ryan '35, Super Steels, Inc., 1811 West 74th Street, Chicago.

Also, M. Robert Saslaw '36, Federal Telephone and Radio Company, Newark, N.J.; Blake M. Loring '37, United States Naval Research Laboratory, Washington, D.C.; Carl H. Muehlemeyer '37, O. T. Muehlemeyer Heat Treating Company, Rockford, Ill.; Robert D. Williams '37, Battelle Memorial Institute, Columbus, Ohio; Rolland Sydney French '38, Bridgeport Brass Company, Bridgeport, Conn.; James B. Hess '38, Dow Chemical Company, Midland, Mich.; Richard H. Kaulback '39, Syracuse Heat Treating Corporation, Syracuse, N.Y.; Paul Gordon '40, M.I.T., Cambridge, Mass.; Otto Zmeskal '41, Universal-Cyclops Steel Corporation, Bridgeville, Pa.; Edward E. Barney '42, Frigidaire division, General Motors, Dayton, Ohio; William R. Johnson '42, Halcomb Steel division, Crucible Steel Company of America, Syracuse, N.Y.; Willis G. Lawrence '42, American Manganese Steel Company, Chicago Heights, Ill.; Dara P. Antia '43, Aluminum Products Company of India, Calcutta, India (at present with Aluminum Company of Canada); A. Donald Moll '43, American Man-

ganese Steel division, American Brake Shoe Company, Chicago Heights, Ill.

*Technology Club of New York*

James H. S. Bates '85, who was formerly an active member of the Club but of late years has been a resident of Olympia, Wash., has elected to join our select group of life members. A new regular member is Sherman M. Goble, Jr., '31, Rufert Chemical Company division, Seymour Manufacturing Company, Seymour, Conn. The Club's open bridge tournament was scheduled on Monday evenings, November 1, 8, and 15. The Ranger Trophy went to the club champion. Guests included members of the Williams Club and the well-known College Bridge League.

Extensive alterations are being planned for the Club. The remodeling which has already been started will make it an even more desirable place to stay when you come to New York. We are doing our best to make the Club more attractive to the members and to Alumni from out of town. You will hear more about this as plans progress. — WILLIAM D. NEUBERG '17, Secretary, 24 East 39th Street, New York, N.Y. WILLIAM L. KEPLINGER, JR., '24, Publicity Committee, care of Johns-Manville, 22 East 40th Street, New York, N.Y.

*Technology Club of Philadelphia*

The first fall meeting of the officers and committee members of the Club was held at Kugler's Restaurant in Philadelphia on September 20. There was a very satisfactory turnout. Those present were President E. J. Healy '23; Vice-president H. W. Anderson '15; Secretary G. T. Logan '29; Treasurer G. D. Schrader '30; members of the executive committee: P. H. Chase '09, R. H. Ross '17, S. D. Hartshorn '23, C. M. Phelps '24, W. N. Currier '31, S. K. McCauley '41, and P. M. Alden '22; G. Haslam '15; G. E. Whitwell '14; C. W. Stose '22, R. A. Puchain '17; and A. T. Barclay '22. — GEORGE T. LOGAN '29, Secretary, 1000 Chestnut Street, Philadelphia, Pa. HENRY F. DALEY '15, Review Secretary, B. F. Sturtevant Company, Cresmont and Haddon Avenues, Camden, N.J.

*M.I.T. Club of Central New York*

The Club held a dinner meeting and the annual election of officers on October 7. The new officers are J. Murray Hastings, Jr., '13, President; Louis A. Waters '20, Vice-president; and Theodore E. Simonton, '24, Secretary-Treasurer.

Lou Waters, who is a recognized authority on the subject, gave an interesting talk on forgery detection, during the course of which he showed numerous photographs illustrating his points. — THEODORE E. SIMONTON '24, Secretary, 619 University Building, Syracuse 2, N.Y.

*Washington Society of the M.I.T.*

The October meeting of the Society was held at Barker Hall in the Y.W.C.A., which furnishes adequate room for the larger attendance recently experienced. A 6:15 P.M. starting hour was inaugurated, with dinner preceding the talk. We shall attempt to hold meetings on the second Thursday of the month, and visitors are cordially invited. Of the 200 attending the meeting, some 50 were first-timers. President Mert Emerson '04 introduced our new officers. H. E. Worcester '97 talked briefly of conditions at the Institute, telling of the various Army, Navy, and civilian teams taxing to capacity the athletic fields, Walker Memorial, and the Alumni Pool.

Vannevar Bush '16 introduced Karl T. Compton, President of Technology, as the man under whom he had most enjoyed working. Dr. Compton reminisced on his trip to England, where oranges were reserved only for children's hospitals, and where he had only two real eggs in three months. He said that experience has shown that women are better than men for anti-aircraft watching, because, apparently, they stand the monotony and the bombardment better. While there were 11 raids during his visit, he did not see a single bomb fall or any place hit.

Dr. Compton listed students at Technology as follows: 1,650 Navy; 1,500 Army, and 1,400 civilian. He told of plans for admitting a new February class. He said that in Britain all but the most exceptional students had a choice of four activities: Army, Navy, Air Force, or coal mines. He told of the addition of 710,000 square feet of floor space at the Institute in temporary, semipermanent, and permanent laboratories, and described how a "retread" group of professors were developed to meet peak demands in war courses. He described how research contracts are handled through the Division of Industrial Cooperation and said that 160 of the staff are on leave on a no-loss, no-profit basis. Institute contracts with the government are on the same basis. In closing, Dr. Compton stressed the opportunities in the postwar development of instrument design, electronics, and applied mathematics.

Apparently, the new dinner arrangements were most popular, as this was the largest stag gathering we ever had. The following M.I.T. men and guests attended: '89: G. W. Stone; '90: J. G. Crane, W. B. Poland; '92: B. P. DuBois; '93: P. H. Thomas; '96: W. E. Haseltine, B. Stoughton; '97: P. L. Dougherty, B. A. Howes, F. A. Hunnewell, H. E. Worcester; '98: M. Boyle; '00: F. W. Magdeburg, H. C. Morris, C. H. Stratton; '01: D. E. Bittinger, H. A. Whiton; '03: W. L. Cook; '04: M. L. Emerson, H. H. Groves, F. W. Milliken and guest, G. H. Shaw, G. N. Wheat; '05: J. A. Furer; '07: J. H. Leavell, E. L. Moreland, A. Pope, W. G. Waldo; '08: H. H. Bentley, P. H. Heimer; '09: E. Hahn,

M. R. Scharff; '10: K. P. Armstrong, J. T. Whitney; '11: D. P. Gaillard, E. R. Hall, C. P. Kerr, W. H. Martin, C. G. Richmond, A. W. Yearance; '12: M. C. Mason, R. E. Wilson; '13: L. W. Parsons; '14: A. E. Hanson; '15: A. Abrams, A. D. Beidelman; '16: N. D. Baker, V. Bush, C. J. Davis, D. L. Patten, F. P. Upton; '17: J. P. Ferrall; '18: V. C. Kylberg, H. D. Manuhian, A. F. Murray, H. F. O'Donnell; '19: A. H. Blake, M. P. Smith; '20: J. Nolen, Jr.; '21: A. Addicks, C. A. Ellis, J. A. Mahoney, W. T. Smith; '22: R. H. Blatter, G. P. Brookfield, A. J. Browning, R. C. Burrus, H. H. Fisk, G. R. Hopkins, W. K. MacMahon, C. A. Moore, J. R. Morton, Jr., J. H. Teeter, R. K. Thulman; '23: H. L. Bond, C. D. Williams; '24: J. D. Fitch, J. E. Jackson, L. F. Porter, W. D. Rowe, R. P. Schreiber, W. W. Sturdy, M. N. Waterman; '25: A. R. MacLean, H. B. Swett.

Also '26: S. J. Cole, E. W. Eddy, J. Y. Houghton, T. L. Soo-Hoo; '27: D. F. Horton, M. D. James, G. C. Popp, R. M. Tucker; '28: A. E. Beitzell, J. W. Gaffney, M. W. Keyes, B. F. Miller, W. B. Moore, W. H. Phillips; '29: B. H. Francis, W. S. Hutchinson, Jr.; '30: A. F. Bird, J. R. Bloom, J. George and guest, W. H. Martell, C. W. Maskell, J. A. Mathews, N. C. Nelson, F. W. Turnbull; '31: D. W. Gaskins, F. D. Weeks; '32: M. H. Etstein, L. Glickman, H. Selvidge; '33: W. B. Ferguson and guest, W. H. Foster, J. G. Trump; '34: M. A. Baskin, B. Goldford, G. S. Hammonds, S. van T. Jester, Jr., R. B. Jewett, G. E. Wuestefeld; '35: E. J. Collins, E. C. Edgar, B. H. Nelson; '36: C. E. Crede, H. F. Lippitt, 2d, B. W. Lowe, E. R. Petrebone, 2d; '37: R. M. Cornforth, L. G. Cyr, E. D. Fraser, G. B. Hunter, Jr., B. M. Loring; '38: R. C. Coile, A. W. Innamorati; '39: R. W. Arentson; '40: S. L. Cohen, M. A. Copeland, B. F. Greenberg, R. G. Hall, W. M. Hearon, T. F. Jones, Jr., J. F. Walter; '41: R. G. Blum, E. E. Hayes, E. W. Sheridan; '42: M. R. Brown, S. Monro and guest, D. H. Stansfield; '43: A. F. Hillbourne, Jr., M. P. Seiple, A. H. Shairman, S. Siegel, S. J. Spitz, Jr.; Guests: J. Arango, W. F. Davidson, Mrs. W. E. Haseltine, Joseph Low '18, Mrs. W. W. Sturdy, and H. M. Trent; staff: R. D. Bennett. — FRANK W. MILLIKEN '04, *Secretary*, 613 North Greenwich Street, Falls Church, Va. WILLIAM K. MACMAHON '22, *Review Secretary*, Rosslyn Gas Company, 3240 Wilson Boulevard, Arlington, Va.

## CLASS NOTES

### 1877

I have interviewed the various members of '77 and have not found any items that would seem worthy to include in class notes, unless mention were made of the fact that the Secretary, while spending some time in West Virginia last July, several times met Charles Judson Colgan, son of our classmate who played such an intimate part in the design of the "Minute-man." Judson, Jr., who is district manager of the Pittsburgh and Western Pennsylvania Electric Company, Fairmont, W. Va., was much interested in anything that I could tell him of his father's career at Technology. He and his wife live in a

charming home and treated me and my friends most cordially. — GEORGE W. KITTREDGE, *Secretary*, 592 North Broadway, Yonkers, N. Y.

### 1885

Louis E. Reber, D.Sc., is one of the seven living founders of the Society for the Promotion of Engineering Education, and is one of three founders now living who have been closely connected with the history of Pennsylvania State College. Dr. Reber was the first dean of the school of engineering in that college. He was born in Nittany Hall, Centre County, Pa., on February 27, 1858, and entered the preparatory department of Penn State in 1876. After his graduation in 1880, he served as an instructor there. He also took graduate work at Technology. He became Penn State's engineering dean in 1895, and served in that capacity until 1907, when he became dean of the extension division of the University of Wisconsin until his retirement. — ARTHUR K. HUNT, *Secretary*, Longwood Towers, Brookline 46, Mass.

### 1888

Your Secretary has asked the Assistant Secretary to pinch-hit again on class notes. Bert's own accomplishments seem most noteworthy of all. In a letter written to Ted Foque from Chebeague Island on October 11, he tells of winding up his 100 foot by 60 foot victory garden. These are his rations for one dinner: a four-pound chicken, fried southern style, and from the garden, hard-shelled winter squash, Kentucky Wonder string beans, boiled potatoes with parsley sauce, applesauce, ice cream, and jelly roll. Bert burned eight cords of wood cut from his six-acre wood lot in the previous five months. He carried it in a handcart up over the steps, then over the rugs into the house. Ted Foque, by the way, writes from Wayzata, Minn., of his ensign grandson away somewhere and of his boy at the university.

Of special interest for all M.I.T. men is the note from Ned Webster, dated October 15, saying that he had just attended the meetings of the Executive Committee and the Corporation of Technology, which were the most interesting ones he had ever been to. He tells us that we can all feel proud of the war contribution Technology is making. Your Assistant Secretary, from his War Department days, can vouch for the fact that the Institute has made a great contribution to the war effort.

As to the experience of the writer of these notes, who is now back from the Washington consulting service and is again serving as president of the Thompson and Lichtner Company, Inc., the following copy of a notice from one of our shipbuilding clients to its employees indicates some of the results of his company's work in aiding the man-power situation and speeding production: "The corporation in common with other vital war industries in Maine is faced with a serious shortage of man power. It is necessary, therefore, to devise ways and means of making the most effective possible use of the man power available in this yard. Through a simplification of paper work, it is now possible to make available for ship production certain employees now doing clerical work, keeping records, planning, and so on.

"A considerable number of persons doing this type of work in Departments 44, 15, and 30, have been offered transfers to production jobs. They have received a week's notice of the termination of their present jobs in conformity with our union agreement. Lists of the employees immediately involved have been furnished to the union with a full explanation of the necessities of the situation. We hope that with the co-operation of the union all will pitch in and help us produce ships. There is a job for everyone now on our pay roll, but it may be a different job."

I regret to announce the death of two classmates. Charles G. Rice of Ipswich, Mass., who was formerly president of the United States Smelting, Refining and Mining Company, director of the First National Bank of Boston, and director of the United Shoe Machinery Corporation, died on July 29. He leaves 12 grandchildren and three great-grandchildren. — Ernest B. Moore of Medford, Mass., who died on May 1, was trustee of the General Manuel C. Lawrence Estate and chairman of various civic organizations, including the board of trustees of the Medford Public Library, the board of trustees of the Lawrence Memorial Hospital of Medford, the Medford Home for Aged Men and Women, and the Lawrence Light and Gas Associates. His ancestry dates from the early settlers of Maine. He was a 32d degree Mason. — BERTRAND R. T. COLLINS, *Secretary*, 39 Wiggins Street, Princeton, N. J. SANFORD E. THOMPSON, *Assistant Secretary*, The Thompson and Lichtner Company, Inc., 620 Newbury Street, Boston 15, Mass.

### 1889

The Secretary has to record the death of Clarence Norris on August 1. The following account of his life is from the Boston *Herald*: "Clarence G. Norris, 76, of 263 Blue Hills parkway, Milton, for more than 40 years an engineer in the public works department of Boston, died. . . . Born in Chelsea, he moved to Hyde Park at an early age. He was a graduate of Hyde Park High School and Massachusetts Institute of Technology. He worked in Indiana for a short time before taking a position as town engineer for Hyde Park.

"He became associated with the Boston public works department when Hyde Park merged with this city. He retired six years ago. He was a member of the Masonic fraternity and held membership in the Royal Arcanum and Knights of Pythias. He leaves a widow, Mrs. Grace Norris and two daughters, Dorothy H. and Mrs. John E. Stahl, both of Milton. . . ."

The Secretary also had news, but no details, of the death of Oscar W. Pickering of Ann Arbor, Mich., on August 31, 1942. — WALTER H. KILHAM, *Secretary*, 126 Newbury Street, Boston 16, Mass.

### 1891

At last we have heard from Charlie Ricker, who was laid up last summer but is now feeling all right again. He plans to go back to Havana this winter. He writes from his farm at Salamanca (near Jamestown), N. Y.: "This is a lovely place, but it seems to be a hoodoo for me. I arrived about May 1 and was just getting started when some kind of a bug got me. I must have my house painted before leaving. It is



1891 Continued

hard to find anybody to do it, but a local painter, reputedly good, has agreed to begin soon, and we are hoping for fair weather.

"On the way north I stopped in Washington to visit my son, Charles, Jr., '28, and plan to do the same on the way south. By the way, I have a new grandchild, Charles Elliott Ricker, born on June 7. I haven't seen him yet, but in his photograph he looks husky, and his record is good to date.

"I fear this place is too much for me to take care of with no more help than can be had these days, and if conditions next year are the same, I shall try to dodge the jinx. I'll leave the farm to take care of itself and go back to the White Mountains. I have long had an ambition to climb Mount Washington on my 75th birthday (July 17, 1944), and shall begin at once to train for it."

Gorham Dana is back from his summer home at Lake Sunapee, and looks very fit. He was kept to the house for quite a while last spring. He is still active in Brookline town affairs, zoning, city planning, and so on. — A brief letter from Walter Douglass advises me not to retire, so I will try to hang on, at least for the duration. Walter is in Florida, hence he doesn't have to worry about heating problems.

Frank Howard wrote in October, and the inventory he gave of his general condition is worth repeating, as it gives the rest of us something to shoot at. He writes: "Health and appetite good; disposition cheerful and tolerant; condition of servitude mild; interests plentiful and varied, but not exacting; worries on the shelf; and prospects hopeful. I am able to do a fair day's work. I took a cruise on a schooner from Camden, Maine, in July with another young M.I.T. man, George Hayden '95, and so learned that '91 didn't get all the fine fellows. We had a good time, but the ban on cameras prevented me from bringing back pictures to prove it.

"My grandchildren are pretty well scattered, one in Panama, one in Iceland, one in Miami, one at Atlanta, Ga., and four at home in Winchester, as is also that *great-grandson* you have already heard about." He mentioned that his daughter-in-law saw Hanington.

Hanington writes from Denver: "Dana and Putnam are the only ones besides yourself that I hear from. A long letter from Putnam came last week, containing mostly reminiscences of doings around Chester Square. Howard's daughter-in-law was here a month or so ago to see her son, and by accident I met her here at the museum making sketches of some of our groups. We invited her to the house for dinner and met Howard's son, who came for her. He has since been transferred to some other locality. The 1941 ash tray is on my desk before me to remind me of past good times. I also have a pipe of 1916 vintage in my rack, with 1891 cut on the front of the bowl.

"Our attendance here at the Colorado Museum is forging ahead despite gas rationing and the war. To date we are ahead over 100,000, and will nearly reach the million mark by the end of the year. About 10 per cent of our visitors are boys in uniform, many of whom bring their girl friends. The museum is located in City Park

on a high point, from which you get an extended view of the mountains to the west. Remember me to any of the '91 men you happen to see."

We received an interesting letter from Charlie Garrison in Santa Barbara, from which a few extracts follow: "With the limited gas supply, our radius of travel has been greatly shortened. Our old average of 1,000 miles a month has vanished, and we have to confine ourselves to the home area. Once in a while we save enough to visit our son Robert in Pasadena. I haven't seen the Alleys or Vies for a long time. Bert Kimball called here after the 50th reunion. His sister, Evelyn K. Richmond, is a neighbor, so we keep in touch with Bert's whereabouts. We have, however, been to Berkeley to visit our daughter for a couple of weeks. There we saw Ernest Hersam, who lunched with us. He seems very well and is always busy. We always see him on our visits there, as we consider him almost one of the family. Our daughter had her vacation while we were there, and we spent a week at Inverness, where she has a small cottage. Our daughter is second in command of the Family Service Bureau of Oakland, where she has been working for several years. We have often driven about the country when she was arranging for children to be placed on farms. My son Bob is very busy with the installation of oil wells. He is the engineer for a large tract in Huntington Beach.

"We feel quite settled in our present house. It is on high ground with a good view of the ocean, some three miles away, and we see the distant islands on clear days. On the roof of the piazza is perched the 'happy Jack' given me on our 40th reunion at Osterville, and on the peak of the roof is a weather vane of flying birds I got at South Yarmouth on our last trip east in 1940.

"We are very fond of walnuts and use large numbers each year. I have just laid in some 40 pounds, and if you could look in on our back piazza you would see me cracking the nuts frequently. I thought that a good name for our place would be the 'Nutcracker Suite'."

Francis Holmes writes from Plymouth that he still goes to the office regularly. His garden took most of his spare time this summer. As he said: "I enjoy having things out of my own garden to eat and also to give away. . . . My grandchildren are well and have kept busy on their farm."

We heard from Ernest Hersam recently. He said he had not seen Leland for some time. He mentioned the visits of Charlie and Mrs. Garrison and of Ernest Tappan, who called on him some time ago. Speaking of New Englanders, he says: "Send them out here as often as you can, and come yourself."

Here are some extracts from a letter from Ralph Colburn in Holliston, Mass., which shows how one of our classmates has made use of present conditions to be of real value in war work: "About a year ago I thought my other business would be on the 'bum', so I bought a lathe, drill, planer, and milling machine, and a small turret lathe, and hired a room, 45 by 70 feet. My daughter called it my plaything. I started out with one elderly man who was down and out but had worked in a machine shop 25 years ago. I finally got some machinework

for one of the sprinkler companies, and now I have 60 men working three shifts. We machine five tons or more of castings a day and have work on hand till March.

"My son Robert lives in Knoxville, and is construction plant engineer of the Tennessee Valley Authority. He has two children, a boy and a girl, so you see I have two grandchildren. My daughter Adelaide is a teacher in the Melrose High School. She comes home every Friday and stays till Sunday night. The rest of the time I am my own housekeeper."

The following changes in address have been received: Francis B. Choate, 267 Throckmorton Avenue, Mill Valley, Calif.; and Mrs. Alfred B. Robinson, Hotel Winslow, 45 East 55th Street, New York, N.Y. — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R.I.

## 1895

The man-power shortage in some sections of the country is truly more acute than in others. Your Secretary can attest to this, because he is constantly being called upon to officiate as the handy man in his community. This accounts in part for his tardiness in answering some of the interesting letters received from classmates.

Censorship, of course, forbids publishing some of the details of war work, but ultimately some news of war projects may find its way into these columns from time to time. All of us are in this war. We all are busy, as we should be. A post card is big enough to tell your Secretary where you are and what you are doing. Have a heart! Get your post card and jot down at least a hello. It will be appreciated. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass.

## 1896

We cannot yet point with pride to our record in the Alumni Fund. At the end of September, after the first six months of the current fiscal year, we had 85 contributors, or 95 per cent of our number quota, but the amount contributed was only \$1,493.50, or but 73 per cent of our money quota. If anyone has been holding back this year, he should now come forward and get his contribution into headquarters. Our record in past years has shown that our number quota usually reaches 100 per cent, but we have been weak on the amount contributed and have never reached 100 per cent in that respect.

Dr. Coolidge was featured in the October issue of the *Tech Engineering News* as the alumnus of the month. A sketch of his career was given with a few highlights of his accomplishments. The issue also contained an article by Dr. Coolidge entitled "Peacetime Salvage from Wartime Research," which outlined the developments taking place during the war effort which would become of wide use and benefit in our lives when the war is over.

Con Young and Abby decided that the rigors of another winter on Cape Cod would be too much, particularly as the doctor's diagnosis was that the Florida climate would be far better for Abby's health and strength this winter and that Con's neuritis and colds would not be helped any by a Cape Cod winter. The Youngs will have to forego the pleasure of their automobile in



1896 Continued

Florida. They left Bass River on September 18, and stopped over with friends in Bridgeport until October 8. They left their car there and departed from New York, October 9, due in St. Petersburg the next day. A card from Con later reported his arrival and satisfactory location in a domicile through the kind offices of Irv Merrell. His address for the winter is 131½ Fourth Avenue North, St. Petersburg, Fla. The sun welcomed them, and they also had a call from Irv, who was having them to lunch. Irv's large home is out on the Key, and he goes to his real estate office only twice a week, the office being run by his son-in-law.

Arthur Baldwin reported to the Secretary on Saturday, October 9. He and Mrs. Baldwin were staying at the Copley-Plaza for a few days and paying a visit to their son in Cambridge. Their trip north from Virginia had included stops in New York, Schenectady, and other places. In Boston it was made the occasion of an enjoyable lunch by the Secretary and Arthur together at the Parker House. Arthur reported that in Schenectady he had seen Walter Stearns, who was due to retire on December 31, and was all set to start out on January 1 for Florida for the balance of the winter. Arthur seems to keep busy on his three-acre ranch out from Charlottesville, Va. His agricultural efforts are not extensive, and one thing he is doing especially is the planting of various fruit trees, which will be of value to the next generation. Subsequently the Secretary received a note from Walter Stearns asking for Con Young's address. Walter's desire is to get information about hotels in Fort Myers, Fla.

Bill Dorrance wrote that he and Mrs. Dorrance made a trip to Cape Cod in the late summer and spent part of their time at East Bay Lodge. He said that the lodge was then under new management because of the illness of Charlie Brown. To get the whole story, the Secretary wrote Buster Crosby in Osterville, and classmates will learn with great regret that misfortune and ill-health had overtaken our genial host, so that he suffered a breakdown and had to give up his hotel. This leaves us out on a limb for future five-year reunions, because of our agreement with Charlie Brown that he would take care of us up to our last man. However, the hotel was operated this summer, and presumably will be operated in subsequent years, so that there seems a fair chance that we may be able to gather there again for our fiftieth anniversary in 1946.

Dr. Rockwell has received a card from Ralph Henry from his summer home in Laconia, N.H., where Ralph runs a little summer business of real estate, insurance, architecture, and engineering in partnership with F. Newton Williams, under the firm name of New England Estates. This indicates that Ralph may be in competition with Dan Richardson, who runs the Holiday Bungalows located outside of Laconia. — Classmates will be happy to learn that Butler Ames has been elected by the M. I. T. Corporation as an alumni member of the Visiting Committee on the Department of Military Science and Tactics.

M. L. Fuller recently wrote Frank Hersey to the effect that he and his wife plan to continue their stay at Fulton Cottages,

Rockport, Texas, through the coming winter. The limitation of gasoline has circumscribed their movements, but last spring they did get a 500-mile trip into the Rio Grande country, averaging 20 miles to the gallon, traversing several oil fields and across the big 1,000,000-acre King Ranch. They saw big flocks of Rio Grande wild turkeys, the first they had ever seen, and saw the tropical products of the Rio Grande Valley. Life at Fulton Cottages last winter was very enjoyable, with only two days of frost and, although the summer thermometer registered 90 degrees frequently, a good sea breeze prevented discomfort. The food situation has been satisfactory, with plenty of meat and fish, although there has been a scarcity of canned meats. Fruit in considerable variety was available, with cantaloupes at five cents each and lots of watermelons at 25 cents each. Bananas and oranges were nearly always obtainable, and an ample butter supply came out of the Rio Grande Valley. Apparently life was not too bleak in Texas for the Fullers, except for the gasoline limitation. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge 39, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge 38, Mass.

## 1901

Grace MacLeod, professor of nutrition at Teachers College, Columbia University, whom we reported briefly in the July issue of *The Review* as the chairman of the Nutrition Committee of Greater New York and chairman of the nutrition advisory committee of the New York chapter, American Red Cross, has assumed additional duties in that field. A newspaper clipping states that added impetus was given on June 29 to New York City's nutrition program, originally set up by the department of health to disseminate information concerning the best use of the available food supply in terms of a well-balanced diet. Members of the co-ordinating committee sponsoring the program felt that there was need of a special planning committee within their membership, and voted unanimously to have Dr. MacLeod head the committee.

We talked with Bill Farnham and Harry White recently at a meeting of the American Telephone Company's general departments and the long-lines chapter of the Telephone Pioneers of America. We listened to an interesting talk by our former vice-president and chief engineer, now Major General William H. Harrison. The speech was based on his travels in this country and to the war fronts as director of procurement for the Army Service Forces. The talk was followed by a number of reels of motion pictures taken by the Signal Corps in several theaters of war. Bill Farnham was looking well after a summer spent in his usual haunts at Rockland, Maine. Harry also appeared fit, no doubt partly because of frequent indulgence in his favorite sport, ice figure skating, an art in which he is adept.

The following is quoted from a letter from Nat Patch to Dan Patch and forwarded to us by Ted Taft: "I was sorry that you could not stop off and spend some time here. It would have been a real pleasure to sit down and visit again, and I am looking forward to the first opportunity you can do

so. I do not travel now because I can no longer see to move around. Consequently, when my friends can come to Buffalo I am delighted, because there is very little hope of my being able to go to them." It is Dan's suggestion, and our hope, that '01 men who happen to stop over in Buffalo will give Nat a ring or, better, go to see him. Dan says: "Nat and I have been trying for a long time to tie our two families together, but the final link, back in the past, is illusive."

After being associated for some time with R. Potter Campbell, Inc., New York City, John Eveland moved to Reno, Nev., several years ago and set up as a mining engineer on his own. In the summer of 1942, he went with the United States Bureau of Mines as a specialist in work on lead and zinc properties. Lately he was engaged in appraising the need for access roads to numbers of Nevada mines, principally in the northern part of the state. Recently he resigned his post and resumed his general engineering practice in Reno. — We had a pleasant letter from Phil Moore early this summer saying that he knew our cousins, the Brewsters, who have cattle and horse ranches on Tongue River in Montana. Phil's ranch is also on this river in the Big Horn Mountains of Wyoming.

We report with regret the deaths of three classmates: Roy Bolster on September 8; Edwin Burdick on March 21; and Walter Read on April 30. Roy Bolster was graduated in Course VI and resided in South Laguna, Calif., in recent years. Shortly before his death, his wife died. He came to Boston to bury her in the family lot and died in that city six weeks later. — Edwin Burdick was graduated in Course I. He retired from business some years ago, and at the time of his death was interested in a farm at Pomfret, Conn. He died in Hampton, Conn., from a heart ailment. His wife, Gertrude K. Burdick, and daughter Virginia survive.

Walter Read was graduated in Course XIII and was a naval architect for the supervisor of shipbuilding of the Navy Department. In recent years he had been stationed at the Brooklyn Navy Yard. Before entering the employ of the Navy Department, he worked for several years at the Bethlehem Steel Company's shipbuilding division in Quincy, Mass. He died in a hospital near his home in Rockville Center, Long Island, N. Y., after a brief illness. Surviving are his wife, Mrs. Alice G. Read; a daughter, Mrs. Esther Carter; and a son, Lieutenant Emerson A. Read, United States Army Medical Corps. — GUY C. PETERSON, *Secretary*, 788 Riverside Drive, New York 32, N.Y. THEODORE H. TAFT, *Assistant Secretary*, Room 3-266, M.I.T., Cambridge 39, Mass.

## 1903

At the reunion last June several questions were asked the Secretaries about our numbers both at present and when we were in the Institute. We have been doing a little research work, and with the help of the registrar can supply a few statistics, which we submit herewith for information and record. There were 329 of us who climbed old Rogers steps in October, 1899, full of ambition and determination to be engineers and scientists. By the time we assembled on the steps of the natural history



1903 Continued

building in our third year to have our picture taken for "Technique," we were 227. (Possibly some did not get into the picture, but that number is listed.) In the senior portfolio appear 209 candidates for degrees, of whom 190 actually received the hard-earned sheepskin. Of course all these 190 did not start in '99. Some came from other colleges and took special courses to be graduated with us, and others "because of their youth," as Harry Crowell wrote me several years ago, started before us and were dropped back into our Class. In addition to the 190 who received degrees in June, 1903, any who as special students took the majority of their studies with our Class are now registered with us. Also, many of the original 329 did not complete their Courses but are still registered with us if they attended at least one term, so that we now have 415 names on our roll.

Of these 415 classmates, 116 are deceased, about 280 are known living, and several are missing. Of the 280, about 25 are women. These classmates are living all over the world. The largest group is located in or near Boston, as there are 47 men and 9 women in Metropolitan Boston. The rest of Massachusetts claims 26 men and 8 women, and the rest of New England has 27 men and 1 woman. Therefore, in all New England there are 118 members of the Class living within 200 miles of Boston. In the New York City district, not including New Jersey, there are 18 men and 2 women. The balance of our classmates are widely scattered and include one in South Africa and one on the Philippine Islands.

Those for whom we have no addresses are listed as "missing." Some of these undoubtedly are deceased, but most of them have just failed for various reasons to keep us informed of their whereabouts. Mail has been returned undelivered from their last known addresses, and neither the Class nor the Institute Secretaries know how to contact them. From time to time we publish a list and attempt to locate them but seldom have very much success. Information about these men is always greatly appreciated. While at New London last June, we were glad to get one address.

If anyone in the Class desires the address of a classmate, we shall be glad to supply it.

During the past summer we heard from Bryan, I, who was prevented from attending the reunion because his daughter had to undergo an operation. He has since reported that she came out of it "with flying colors" and has entirely recovered. — Gleason, V, reports from North Edgecomb, Maine, that he "had a wonderful garden and has preserved jars and jars of luscious home-grown vegetables and berries." — Ruxton, II, says: "We have had more work this year than ever before. Priorities, regulations, requests, and labor shortages keep us busy seeing that everything progresses as smoothly as can be hoped for."

The Secretaries wish for you all a happy Christmas, if not a merry one, and prospects of a better year to come — one that will see real progress made toward a world at peace again. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston 9, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 441 Stuart Street, Boston 16, Mass.

## 1905

Class dues continue to flow in, and with them news from many fronts, some of which we have not heard from for years. For instance, Charlie Rodgers, II, of Highland Park, Ill., tells us that he has been unable to work for two and a half years. Perhaps one of the Chicago scribes will give us details about this. Charlie's only son, Curtis C., died in Egypt on May 1. He was in the American Field Service and had served with the British Eighth Army under General Montgomery in the 1,500-mile drive from El Alamein to Tripoli. — Speaking of Chicago reminds us that Clarke E. Warren, II, wrote the following: "The War Production Board took our wire, and so on, and gave it to concerns making lilac snips, which anyone must admit are more essential in winning the war than pants hangers. So we are making airfield landing-mat clips. Two of my sons are fruit farmers in Michigan, and one son is serving in the Signal Corps. One daughter is a church secretary, and one daughter is a sophomore at Carleton College. I have three grandchildren — all girls."

Also from Chicago, Frank Webster, II, writes that he had to go to Canada to meet another Chicagoan. He met Jimmy Banash, VIII, and Mrs. Banash at Murray Bay. Frank says he has nearly recovered from his attack of coronary thrombosis, "but am now so close to 100 years of age that I must give up golf, tennis, and badminton. Hope to meet you all in 1945." Here's hoping it will be in 1944 at Old Lyme, Frank.

Frank Payne, XIII, says: "I am shoving off for a few days of fishing in Wisconsin at one of the places you read about — no cottages, no boats, and plenty of fish." Chicago scribes please locate this utopia for our next reunion. — Dick Senger, III, says that for three years he has been traveling all over the country for the American Smelting and Refining Company, visiting plants, starting scrap drives, advising technical staffs, and so on.

Frank S. Elliott, III, who is with the Skinner and Kennedy Stationery Company, St. Louis, writes: "While I have not followed my profession, I have been in a very interesting business — advertising. It has remunerated me very satisfactorily. I have a son and a grandson, who is now about three and a half years of age. We live here in the beautiful suburbs of St. Louis, and my son works with me at Skinner and Kennedy. For all these years I have enjoyed the very best of health and hope to continue going strong the next few years." — From Roy H. Allen, III, now at Chuquicamata, Chile, S.A., with the Chile Exploration Company, we learn that "there is no news from here. The construction work is progressing, though slowly for lack of supplies, but the next two months promise a speed-up. I expect to be here for a year or more. This part of the country, which geographers state is drier than the Sahara Desert, is ideal for construction work, for there is almost no lost time on account of weather — just occasionally when the winds are too strong. The end of the winter season is approaching, and the temperature is delightful. Only a little heat is required in the houses, except at night. The 9,000- to 10,000-foot altitude does not bother one much."

Ben Lindsly, III, who is still with the Securities and Exchange Commission in Philadelphia, says that the S.E.C. is one agency 100 per cent out of the war, but has contributed much of its personnel to the war, "putting the bee on us who remain." — Elmer Wiggins, V, took my invitation to throw a party for him in Boston seriously, for he phoned the office, insisting on a noon luncheon. Unfortunately, agricultural duties had detained your Secretary, so Wig had to plan his own welcome home. — From Fred Bennett, I, we learn that Phiz Physeck, I, is with Boeing Aircraft in Seattle. He has two daughters and two granddaughters and is still going strong on his job as procurement auditor. Fred confesses to standing on the side lines watching things go by. He wrote: "Since 1941, when my heart went back on me, I have been enjoying (?) ill-health. I convinced myself that I was through work and was lucky not to be in pain — that I was lucky to have a good home and wife and to be able to get around with my friends. So if '05 ever gets together at Old Lyme again, put me down as present."

Clarence E. Gage, II, invites us all down to St. Petersburg, but as the prospectus on his apartments does not give the rates, and as all the dues for 1943 are not yet in, your Secretary will have to pass up the invitation. Clarence writes: "We arrived here on September 17, 1942. The winter story is very easily told: getting the building ready, but having only 50 per cent of normal business, then closing up in June, I went to Hot Springs, Ark., for three weeks to try to get some of the arthritis out of my system, and then went to Evansville, Ind., to visit my daughter. From Evansville I went to Detroit to see my little granddaughter and my son Robert, who works for the American Brake Block Company there. He is foreman of their plastics department. While in Detroit, I had my second examination for service, and this time they threw me out and locked the door. They didn't want me even for limited service — and that after over 15 years in the Ordnance Reserve. Last winter the season, as far as tourists were concerned, was worse than the year before. But about February 15, Army Air Forces officers from MacDill Field started coming in. Just now we are 85 per cent full."

In a contest for brevity, Phil E. Hinkley, II, would take the award. He signed his name to a check, then wrote on a card, "Greetings," and signed his name. Second prize would go to Dan Adams, II, who writes, "All I have to boast about is a granddaughter, — one and a half years old now, a pip." The third prize would go to Thomas Shaw, VI, who wrote: "For class statistics I can report two grandchildren, Linda K. and Robert K. Blagg, aged 27 months and 3 months respectively. Of course they are the best ever." The fourth prize would go to Charlie Smart, II, who said, "Enclosed are class dues [plug No. 3]. No news, same work, same troubles, same joys, same wife, same secretary. Have four grandchildren."

Mrs. Stephen B. Davol, VII (nee Amy Putnam), died on December 25, 1939. — FRED W. GOLDTHWAIT, *Secretary*, 274 Franklin Street, Boston 10, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 137 Newbury Street, Boston 16, Mass.

## 1907

While Phil Walker was on his vacation on Cape Cod last summer, he went to Woods Hole and hunted up George Griffin, who for years has lived in this town in Massachusetts. Phil reported that George looks just about the same as ever and continues to be very active as engineer for the town of Falmouth's water department. He is also engaged in private work in surveying and in water engineering in the entire surrounding area. Water supply was extended from Falmouth to Camp Edwards on the Cape during last spring and summer, and George had an important part in that project. He also does a great deal of law work on land cases in the territory. He is the leading layman in the local Episcopal church and is president of the Woods Hole Library Association. His daughter Charlotte works in the government hydrographic department at Woods Hole, and both of his sons are in the service, one of them being a captain in the Army in charge of the testing of automotive equipment at the Aberdeen Proving Ground in Maryland.

In the November Review I gave a new address for Albert L. Burwell as 944 Chautauqua Avenue, Norman, Okla. As the result of writing to him, I received on October 16 a letter written on the stationery of the Oklahoma Geological Survey, where Albert's name appears as chemical engineer. He wrote as follows: "... I was happy to hear from you because it is always so pleasant to have recalled to mind those years I spent in Boston. I think that during the past 20 years I have met only two classmates. Before he passed on, I talked a number of times with Frame when I was in Tulsa. I have also met Leavell a few times.

Nothing of very great interest has happened to me in these years. Back in 1930 I got mixed up in a hunting accident which kept me out of circulation for 32 months. I have, however, recovered completely. After this enforced idleness I went to work for a wholesale and jobbing heavy-chemical distributor in Tulsa. Purchasing occupied part of my time, but mostly I tried to be a salesman. ... For the past two years I have been connected with the Oklahoma Geological Survey, in charge of the analytical and the research laboratories, and acting as consultant on chemical matters, especially from the standpoint of utilization of our natural mineral resources. The work is interesting, it fits into the war picture, and it is not quite so strenuous as either production or sales work. It is a big jump however, from competitive business to the academic atmosphere of a university campus. ...

In October, I received a card announcing the association of Lester W. Brock of our Class and a Sylvester Caldwell in the Caldwell Company, 2413 First Central Tower, Akron 8, Ohio, representing Thompson, Weinman and Company, Inc., the Synthetic Products Company, and Harmon Color Works, Inc. I wrote to Lester seeking more information but have not heard from him. — BRYANT NICHOLS, Secretary, 23 Leland Road, Whitinsville, Mass. HAROLD S. WONSON, Assistant Secretary, Commonwealth Shoe and Leather Company, Whitman, Mass.

## 1909

Paul always goes to Maine during the summer, and his experiences are always of interest. He wrote: "About Christmas in 1915, I called on Arlo Bates at his home on Otis Place in Boston. We sat in the bay window and looked down the street and across the Charles River basin to the buildings of the Institute as they neared completion. Arlo told me he was not going to Cambridge. He was sure that no such good work could be done in the new swanky buildings as was being done in the smoky laboratories of Copley Square. I wish Arlo could have been with me in September as I stopped off to spend a day in Boston and at the Institute on my way to my favorite haunts on the coast of Maine.

"Jim Killian '26, Executive Vice-president; Horace Ford, a good friend of '09; H. E. Lobdell '17 and Pete Pitre in the Deans' Office; Bat Thresher '20 and Paul Chalmers in the Admissions Office; and Fred Fassett in The Review Office were not in uniform. But they were about the only civilians I saw. The throngs in the corridors between classes were all in uniform. But that's not all that cries to be recorded. As I sat in Lobby's office, I happened to glance out onto Du Pont Court while Lobby was talking on the phone. You'll remember a shallow terrace effect as the lawn near the buildings slopes down to the general level of the court. A sailor's arm began describing generous half circles just at the edge of the terrace. No head or body was in sight — just that arm, back and forth, back and forth. Was that a class in descrip? Was Freehand Charlie anywhere about? Hardly! But those were beautiful half circles! By now maybe you've guessed it — or have you? I didn't! But I thought that gesture needed investigation, maybe for an item for class notes for the December, 1943, Review. (Yes, 1943, if you please!) I looked again, and there were a sailor and his coed on the turf, keeping what looked to me like a sweet rendezvous! Tempus fidgets . . . or . . . can you put that in your pipe to smoke . . . on a nice spring day at Copley Square in the year 1909? Yes, the Institute is a noble institution and all of us old grads can be proud of our alma mater.

"I got as far as Friendship in Maine. I like to compare my route this year with that of my first visit there about 1923. Then I took the steamer to Boston from New York. After a day in Boston, either the *Camden* or the *Belfast* of the Bangor Line took me to Rockland. There I was tumbled out about 5 o'clock in the cold and pretty gray dawn of a September morn in the month I liked best to visit that noble coast. In a few minutes, there sailed the good ship, *J. T. Morse*, a small side-wheeler that was as much a part of the scenery in Penobscot Bay as Boston Light or the Statue of Liberty is in its respective harbor. At Stonington, a lobster fisherman's boat took me to Isle au Haut, the remote isle that Ike Hazelton '94 told me about one day in the Technology Club in Gramercy Park. I've always thought that every time I changed conveyances in those ancient days, I consciously left the city and all it stands for farther and farther behind me. Now you cannot go to Maine by water at all. I cannot even drive up in my car. I went as far

as I could by train, and had to stop at Friendship. The Isle is out of reach for the duration."

King Bullens, III, of Pottstown, Pa., has been appointed a member of the advisory board of the Philadelphia Ordnance District, United States Army. — George Wallis, II, President of the Creamery Package Manufacturing Company and Assistant Class Secretary, writes from Chicago: "Considerable publicity throughout industry was given to the appointment of John W. Nickerson, II, as director of the management consultant division of the War Production Board. On September 24 he paid a visit to Chicago. He spoke at the meeting of the Chicago Association of Commerce in the grand ballroom of the Palmer House, and his address was one of the best in the series of meetings sponsored by the association this year. You will be interested to know that the Association of Commerce at its last meeting departed somewhat from the usual programs devoted to industry matters. Edward L. Ryerson, I, President of the Orchestral Association, was one of the speakers. In addition to listening to a brief concert by the Chicago Symphony Orchestra, we heard a very fine address by John Erskine, director of the Metropolitan Opera Association.

"I spent as much time as possible during July and August at our place in Wenham, Mass., but you can understand that there was not much opportunity to fan out into the surrounding territory. We did, however, thoroughly enjoy a visit with our daughters and grandchildren."

Word has been received that the present address of the Scharffs is 3860 Rodman Street, Northwest, Washington 16, D.C. Their son, Samuel, is at Fort Monmouth, N.J., in the officers' training school — Phil Chase, chief engineer of the Philadelphia Electric Company, again has demonstrated that the long hard hours spent in Course VI were not wasted. The August number of *The Car*, a publication of the Automobile Club of Philadelphia, shows Phil with an up-to-date Chevrolet coupé, which he had equipped to beat gas rationing and the "gas stoppers" of the Office of Price Administration. Under the hood is a 20-year-old electric-vehicle motor, mounted on the same points as was the gasoline motor and coupled to the transmission in direct drive. There is no clutch or gearshift. The storage batteries are stored in the rear in the luggage compartment. Phil does 20 miles per hour, "gets there in a little more time than the gasoline ones," and the radius of action is 40 miles upward.

In the Treasurer's report, among contributions to the Institute by or on behalf of Alumni, is listed the item "Contributions from Class of 1909 — \$500." This amount was received from the estate of Charles R. Main.

Ruth Ogden Pierson, coed member of the Class and a distinguished bacteriologist, died on September 12 at her home in East Orange, N.J. A long obituary notice and her picture appeared in the *Newark News* on September 14. She was born in China, daughter of missionary parents, was graduated from Alma College, Alma, Mich., and did graduate work at Stanford University, Harvard Medical School, and M.I.T. In World War I, she served as a bacteriologist. Later she owned and oper-



## 1909 Continued

ated a clinical x-ray laboratory at San Francisco. For the last 18 years she had been bacteriologist on the board of health in East Orange and is believed to have been the first woman in the country to serve as a state bacteriologist. She also served in that capacity in Rhode Island. She was the leader of many civic, clinical, and religious activities in her community. — PAUL M. WISWALL, *Secretary*, 90 Hillside Avenue, Glen Ridge, N.J. CHESTER L. DAWES, *Review Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries*: Maurice R. Scharff, 3860 Rodman Street, Northwest, Washington 16, D.C.; George E. Wallis, 1606 Hinman Avenue, Evanston, Ill.

## 1911

Once again it's a Kenney lead for the class notes. I'm sure you all got the big thrill I did in mid-October when the newspapers screamed forth the smashing assault which made a smoldering graveyard of the major Japanese base of Rabaul. The attack downed 177 enemy planes and sank 123 ships. And our Lieutenant General George Churchill Kenney, I, air force commander for the Allies in the South Pacific, planned and executed the coup! In the evening papers the same day came the typically Kenneyesque touch, as related by the Associated Press in a delayed dispatch. The story, headed "Snake-Eyes for the Japs," told us that George "rolled his famous good luck dice before his fifth air force struck a sledgehammer blow at Japan's key base of Rabaul, New Britain. . . . After he did that, he felt better. General Kenney has carried the tiny dice ever since a Catholic priest in Paris gave them to him in 1917. After the armada of planes was in the air, the little man who boasts he has the best airforce in the world took out his dice, rattled them and rolled while others in the room held their breath. He had shot an eleven!" As Sellie Seligman, III, who went with George to Brookline (Mass.) High School, wrote on a clipping he sent me: "Doesn't this sound natural?"

Another junior '11 marriage: Eloise Elizabeth Ferris, daughter of Mr. and Mrs. Livingston Polk Ferris, VI, of Montclair, N.J., was married to Howard Martin Mulder on October 23. Best wishes to the young couple!

Congratulations to Hal Robinson, I, a fellow Worcesterite, who in mid-October was promoted to the rank of major. Major Robinson was commissioned from civilian life in May, 1942, and after attending officers' training school at Miami, Fla., was assigned to Pendleton Field, Ore. He later served at Pleasant Grove, Utah, and was then transferred to the Pocatello Army Base in Idaho, where he is in charge of supplies and procurement. He is also head of the aviation cadet examining board at the base.

In one of a series of articles on "New England Colleges in Wartime," the *Boston Post* covered Northeastern University and paid this tribute to our Carl Ell, XI, its second President, now in his fourth year of leadership: "Dr. Ell has been a dynamic force in bringing the university to its present scope, with some five colleges, a technical institute and two secondary schools. Dean of the School of Engineering from 1917 to 1940, as well as executive vice-president of the university from 1925 to

1940, he established the co-operative basis — alternate 10-week periods of study and of paid, related outside work."

Bob Haslam, X, public relations director for the Standard Oil Company of New Jersey, recently announced plans for making *The Lamp*, the company's official magazine, a more effective and widely distributed medium for keeping stockholders, employees, and the public informed on company affairs and activities. Principal changes will be to increase the circulation, to introduce a new format of more striking character, and to include more articles and pictures of general interest relating to trends and developments in the oil industry.

At the 72d quarterly meeting of the New England Council in Boston early this fall, Burleigh Cheney, II, chairman of the council's aviation committee, outlined the region's aviation needs. He said, in part: "Where air transportation is concerned there are no bottleneck gateways, no barriers of water or mountains to separate New England from the rest of the country. To you in Washington we would say that New England wants competitive services authorized; it wants overseas air transport based on Boston or other New England ports; it wants its proper share of the Federal funds available for developing our airports and related facilities; it insists upon sharing equally with other sections all the advantages and opportunities accruing from the technical advances in air transport."

Again thanks to you classmates who continue to keep '11 way up front in the Fund procession. Not only have we gone over the top in number of contributors, but we have passed 90 per cent of our \$2,940 quota! — Here are a few address changes: Cleon R. Johnson, X, 466 Alpine Terrace, Ridgewood, N.J.; Nathaniel S. Seeley, II, 115 Van Rens, Stamford, Conn. Major General Sidney P. Spalding has an A.P.O. address. — ORVILLE B. DENISON, *Secretary*, 82 Elm Street, Worcester 2, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

## 1912

The Class is not meeting its quota in the Alumni Fund. Up to September 30, we had made only 81 per cent of our quota of contributors and 70 per cent of our quota of dollars. We certainly should be able to go above our quota of 130 contributors, even though the amount given is small. Our dollar quota of \$2,990 figures out to \$23 each man, which I believe we should be able to exceed materially. The Class of '11 is considerably ahead of us, so let's do what is necessary.

Ray Wilson wrote the following very interesting letter from Washington: "I have been here in Washington over two years acting as manager of the National Bureau for Industrial Protection, an organization supported by the many insurance companies throughout the country as their joint contribution to the war effort. Our staff of selected fire prevention and safety engineers furnishes technical advice and reports on the most important war production plants and on the protection and dispersal of critical material and stock piles to various interested government agencies, such as the Army, Navy, War Production Board, and defense plant corporations.

"We have an active M.I.T. club in Washington, but '12 men are very scarce. About the only classmate I have met is Aksel Pedersen. My older daughter was graduated from Mount Holyoke last year and is now an analytical chemist in the pilot laboratory of Hondry's Catalytic Development Company, Linwood, Pa., working on the development of synthetic rubber and of high-octane gasoline. My younger daughter is still in college.

"I am still maintaining residence in Swarthmore, Pa., and manage to get home nearly every week end, which is a welcome change from the hectic life here. Give my regards to all the '12 men you see and remind them that I shall be most glad to see any who come to Washington. My address is 1522 K Street, Northwest."

Your Secretary had a very pleasant dinner with Carl Rowley in Cleveland recently. Carl is still busy remodeling war plants and this year was not able to get to Cape Cod for his usual vacation. He would be more than glad to see anyone who is passing through Cleveland. Call him at his office in the Keith Building. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown 72, Mass.

## 1913

This month, Bill Ready, VI, leads the list of news-worthy classmates. Of Bill's award Arthur Townsend, II, writes: "The National Company was awarded the Army-Navy 'E' about a month ago, and a celebration was held in Malden. Bill very graciously invited Joe MacKinnon and me to the exercises. We had lunch with Bill and all of the dignitaries and then attended the exercises in the Malden High School auditorium. The exercises were very impressive. The chief speaker was Rear Admiral W. T. Cluverius, who is president of the Worcester Polytechnic Institute. Bill's reply on behalf of the company was very well made, as we should naturally expect. I had an opportunity to chat with Mrs. Ready after the exercises, and I think both Bill and she were very much affected by the proceedings. There was a dinner and dance for the entire National Company family at the Malden armory, but Joe and I decided that that would be a little too much for us young blades. It was a fitting climax to the long and hard work which Bill has put in with his company, building it to such national importance and with such a fine name for a good product. I think we all should salute him."

John Harty, IV, is doing business as the Harty-Blaney Construction Company "in the Huntington Avenue building where we used to get lunch and beer coupons for 35 cents." His company's work involves troop housing and industrial buildings.

Ralph Rankin, VI, of New York, is acting as Bell System liaison man with the War Production Board. He spends every other month in Washington, and his life is busy, interesting, and at times hectic. His two daughters are at school in the South. — George E. Leavitt, Jr., II, plant engineer for the Southern Cotton Oil Company at Bayonne, is chairman of the Plainfield, N.J., section of the American Society of Mechanical Engineers. He is an active worker in the Presbyterian Church.

E. C. Gere, I, a colonel in the Quartermaster Corps, is in command of an Army



1913 Continued

Service Forces depot. His daughter is at Syracuse University studying interior decorating, and his older son, 18 years old, is taking his basic training at Fort Benning, having passed tests to enter an engineering course in the Army Specialized Training Program in December. — P. V. Burt, VI, has the job of housing and feeding the men at the training school for officers of the Navy Supply Corps, Babson Park, Mass. — Ken Blake, XIV, is vice-president in charge of production of dehydrated foods for the Sardik Food Products Corporation, New York City. He is on the road a good deal visiting plants in California, Texas, and Upper New York. If you get hungry, let Ken know. He saw Phil Barnes, X, in Rochester recently.

Ad Cardinal, XI, writes: "Yes, I'm still alive and very busy like everyone else. I'm with Hoffmann-La Roche, Inc., of Nutley, N.J., where I am listed as traffic manager, though that function is only one of my tasks. We are the largest producers of vitamins B and C in the country and turn them out by the tons. Since our foreign plants are in war-bound areas, we carry the world load of the firm on all our other drug products. (The home plant is in Switzerland.) During the spring one day a gent walked into the far end of my office to become involved with my receiving clerk over a shipment of goods to the firm. The clerk said: 'Mr. Cardinal, this gentleman says he was a classmate of yours at college.' I turned and took a look. Thirty years flew by and it seemed like yesterday, for there sure enough was C. W. Brett, looking just as he did 30 years back except for a few less hairs, but with dignified prosperity beaming over him. I'm sure we both got quite a kick out of it. Old friends are always fine to meet."

Lieutenant Commander P. C. Warner is commanding officer of the naval air station at Cape May, N.J., and is tremendously busy. — George W. Bakeman, XI, was chased out of France by the Boches in 1941, and is in an entirely new field as assistant to the President of the Medical College of Virginia in Richmond. — Gene MacDonald, I, writes: "Ralph Rankin, Pete Haynes, and I meet at lunch occasionally to keep a small flame burning for the Class in downtown Manhattan. Recently I saw Charles Edison in the Statehouse in Trenton and invited him to join us, telling him it would be good for his soul to sit down once in a while with fellows whose only concern is to try to make a living." — Clarence Berry, VI, is in charge of the lighting service department of the Consolidated Gas, Electric Light and Power Company of Baltimore, of which Ralph Thomas, VI, is vice-president. Clarence's hobby is United States power squadrons and boats. He is studying navigation and is secretary of the Annapolis Power Squadron.

Jerry Lane, V, is turning out photographic goods for the war effort. He is assistant to the general manager of the Eastman Kodak Company's Kodak Park works in Rochester. — Bob Daggett, XI, finds Chicago climate tough after 18 years in California. — Ken Franzheim, IV, writes: "It has been a long time since I have seen any of the old crowd, although I have been back to Boston for several trips in the past few years. It seems to me we must be about ready for our 50th reunion! I have been de-

signing and planning permanent apartment and residence-hall buildings for war workers in Washington. Our program takes care of approximately 22,000 people in quarters that should be attractive for the next 50 years. The investment is about \$50,000,000 so that you can see that for once the government is finishing a good job in housing." — Edward E. Smith, VII, attended the civil affairs training school at Harvard last summer. He has the rank of captain and is probably now serving overseas in the military government of civil affairs in Allied occupational territory.

Bill Brewster, II, responded to a poke for news with this nice letter: "I am sorry I haven't got much news with regard to other '13 men. Thanks for the nice things you said about Plymouth Cordage advertising. I think it has been pretty effective. We are very busy with war goods and a great deal of our activities are controlled by the government, naturally and properly. This fact occasions many visits for me to Washington and, since we operate in Canada, to Ottawa also. We have had quite a problem in the cutting off of our principal fiber supplies, since about 60 per cent of our supplies before the war came from the Philippines and the Dutch East Indies. We have had to find substitutes and do things we thought we never could do. But the need has been met, at least so far, and when one considers that the demand for rope is probably three times the pre-war demand, the industry has pretty well met its obligation, I think. All three of my boys (and a son-in-law, also) are in the service. The oldest boy is a captain in the Army and is stationed at Chungking; the next one got his wings in the spring and is assistant engineering officer at Valdosta Field in Georgia; and the youngest one, just 18, is in the Marine Corps Reserve at Dartmouth. I have three grandchildren. . . . You and I ought to see each other one of these days. It seems to have been very difficult to work out in the past, but I do hope we can do it."

George Dempsey, X, is sticking to the last. He is in the shoe business, with the guidance of the O.P.A., the W.P.B., and other government agencies. — Ike Eichorn, XI, is busy in Boston with the Massachusetts Bonding and Insurance Company. He hasn't seen any classmates in months. Surely some of us have seen Ike; he's big enough. — Gordon Howie, I, has two sons in the service. Malcolm, the elder, is in the Chemical Warfare Service, and Donald is assigned to A.S.T.U. at the Virginia Polytechnic Institute. Mrs. Howie is doing her bit as a nurse's aide, and their daughter Larna, aged 12, is helping in Red Cross work. — FREDERICK D. MURDOCK, Secretary, Murdock Webbing Company, Box 784, Pawtucket, R.I.

## 1914

Our Class lost one of its most loyal and popular members on September 30 with the death of John Willis Hines. Jack had been a regular attendant at our reunions, as well as at our New York dinners. He will be greatly missed. After having been graduated in Electrical Engineering, Jack went to the American Telephone and Telegraph Company in New York, and then transferred to the Telautograph Corporation, also in New York. He was in the aviation

branch of the Navy in the last War. On returning to civilian life, he rejoined the American Telephone and Telegraph Company in New York, where he remained for 23 years until he was forced to give up active work about a year ago because of a liver infection. His widow, Mildred Warren Hines, and his 17-year-old daughter Elizabeth survive him. The family have lived for many years in West Orange, N.J., where they have taken an active part in community affairs.

Last month we mentioned in these notes that Lucian Burnham, a colonel of the Marines, had returned from Ireland. Burnham now writes that after flying across the ocean, he went to California, where he is in command of an engineer unit. He expects more overseas service soon. — Phil Covitt's son Arthur, who was graduated from the Institute in 1942 with the combined S.B. and S.M. degrees in Electrical Engineering, was married on October 10. He is a lieutenant in the Signal Corps.

Our honorary classmate William Jackson had the honor of receiving the Duke of Windsor on a recent visit to the Institute. Willy made the arrangements — honest — and will tell us about it at our next reunion or dinner. — H. B. RICHMOND, Secretary, General Radio Company, 30 State Street, Cambridge 39, Mass. CHARLES P. FISKE, Assistant Secretary, 1775 Broadway, New York 19, N.Y.

## 1915

We have two choice bits for you. First, Archie Morrison is out of the hospital and convalescing at his brother's home at 12 Glen Road, Winchester, Mass. All the best to Arch for a speedy and complete recovery.

Secondly, George Rooney has left Washington and is back in Boston at the War Production Board office. George has finished his construction work on synthetic rubber plants and appears none the worse for some of the governmental experiences he has had. We're all glad to have him back here with us and welcome him home.

The '15 Alumni Fund score as of October 30: 138 (78 per cent of quota) have given \$2,373.50 (80 per cent of quota). There are only 15 men reading these notes who gave last year but who have not given so far this year. If you'll all shower down at once as generously (or more so) as you did last year, we'll hit that quota 100 per cent.

Read these good and amusing letters from loyal classmates not afraid to see their names in print. From Charlie Williams in New York came this note: "I've just sent a check to the Alumni Fund. Sorry it wasn't more, but when the government gets through with what it's taking and what it's going to take, I think the Institute will be better off than I will. Sorry you didn't get to New York the other day. Gene Place, Hank Marion, and I had a very pleasant luncheon, the enjoyment of which would have been increased by your being with us. I am fairly busy with office work and with the ordinary outlets for us of the middle ages: civilian defense, gardening of a sort, and an occasional pint of 200-proof extract of C.W.W., aged in the arteries. I recommend this last as a swell way to feel noble at little inconvenience and no expense. Otherwise we're just plugging along trying to do more work with



1915 Continued

fewer men and no money. Don't expect to get to the Cape this year except for a week or so. Hope to see you sometime soon in New York if not Down East. Best of luck and hope you get a million for the Fund."

Parry Keller in Akron was wooed back into class interest by the success of our 25th reunion, and sending his check he writes: "I am certainly late in getting around to this one. I hope your State Street banker's address is still good. You should receive a letter from me very soon. This will warn you so the shock will not be too great."

E. E. Proctor of the Proctor Chemical Company, Salisbury, N.C., writes: "I always read your communications from top to bottom and then put them at the bottom of the uncompleted-business file on the corner of my desk. Today I am not too busy, so I am cleaning out the whole pile, including all your cards. Please find enclosed my check for the Alumni Fund. I am always truly glad to hear from you, and if you have any particular news of the Course X boys, I should be particularly glad to have that." — Harold R. Bassett of Crisfield, Md., was recently appointed by the governor of Maryland to the state department of research and education concerned with the tidewater fisheries projects in that state. — L. T. Bengtson is chief architect on the butadiene and styrene plants in Charleston, W. Va., where he has charge of plans, specifications, and requisitions on the building structures.

With his Alumni Fund check, Ken Kahn, Hollywood, Calif., writes: "A year ago last February I stopped building and started work with the Lockheed Aircraft Corporation. My job is department 1, chemical engineer. It's back to the type of work I trained for at M.I.T., and I am very busy, happy, and I hope useful. I have charge of the oil, chemical, and experimental group, maintaining all chemical processing and the like. The Kahn Construction Company is still in existence, and I still retain my partnership interest and license, but we are not operating at present. It seems good to be back in chemical engineering, and I sure do appreciate the training I got back in '15. Lockheed has many M.I.T. graduates, some of whom I know quite well. I still see some of our old crowd occasionally. I met B. C. Boulton '16 recently for the first time since school days."

The passing of another classmate brings sadness. To the family of Edward Schoeppe, IV, who died on October 18 in Philadelphia, goes the sympathy of the Class.

These notes have been prepared with the kind help of Virginia and Barbara Thomas, who gladly and willingly contribute their mite to "help Azel." Go, thou and do likewise. — AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline 46, Mass.

## 1916

C. J. McCarthy, vice-president of United Aircraft, broke into print recently when he gave a talk in Bridgeport, Conn., concerning his extended air tour of the Southwest Pacific. The Bridgeport newspaper account follows: "C. J. McCarthy, vice-president of United Aircraft, just back from a 24,000-mile tour of Pacific battle zones, revealed this development in an interview here. . . . He gave an eyewitness account of conditions in the Pacific,

particularly the southwest theater of war, where he said the Corsair fighter plane is 'filling the bill precisely — it is just what the pilots want.'

"Mr. McCarthy made the trip to obtain information on just how well the Corsairs were suited for the job which they are being called upon to perform and to determine wherein they could be improved to make them even more useful. The Corsair, he pointed out, is a completely equipped United Aircraft product, with a Chance Vought plane, Hamilton Standard propeller and Pratt and Whitney engine. 'The opinion of the Marine pilots concerning the Corsairs was summed up in an official dispatch which said in part: "It is an excellent plane — outclasses anything in this area,"' Mr. McCarthy explained. 'In general they were delighted with the Corsair because the plane has such excellent performance — being so much superior to the Zero, being so easy to fly and having such excellent maneuverability at high speeds. Also, they found that the Corsair packs a terrific wallop in its guns,' he said.

"The ground men, too, were very well satisfied except for a few difficulties common to a new type. They were able to keep an extremely high percentage of Corsairs in the air at all times in spite of the limited facilities and tools — which speaks well for the Corsair's sturdy construction. In this connection, the pilots told me that they were impressed with the "solid feeling" of the plane in a dive — that they didn't worry about the strength of the craft. The Corsair is far ahead of the latest model Jap Zeros in speed, firepower and pilot protection, and in maneuverability at high speeds," he said. 'In construction, the Corsair is much stronger and can out-dive a Zero at any time. The Corsair's armor plate and self-sealing gas tanks give it a big edge in pilot protection.'

"Mr. McCarthy said he was impressed with the enormous scope of war, the tremendous distances involved and the long, hard journey which it will be to get from where we are now to the vital parts of Japan. 'It's not going to be an easy victory,' he said."

Another of our traveling classmates is Ed Ekdahl, who recently wrote me as follows: "I went to Portland, Ore., the middle of January — drove out during the worst week of winter, and had to drive 4,200 miles to dodge ice, snow, blizzards, fog, and weather that was 30 degrees below zero. Went out to make a valuation survey — public utility — and expected to be gone about a year, but managed to make a tentative job do instead and came back to the East the end of April. I had my family and dog along. The poor dog nearly starved to death for lack of bones in Portland. . . . I barely had three days in New York — long enough to pack my family and to leave my car parked on the highway back in Nyack when I was rushed down here to prepare a story for a hearing of the Securities and Exchange Commission. And now I expect to return to New York in a few days! Thereafter maybe to the West again, the Southwest, or the South. That is Ebasco Services, Inc.!"

Wallace Wentworth, XIV, who had been working with the Army Services of Supply in Washington for over a year, has recently been moved to the Quartermaster

Department in Philadelphia. He was last reported as living in the St. James Hotel in Philadelphia.

As of September 30, the Class had met 71 per cent of its quota of contributors for the current M.I.T. Alumni Fund. This is a reminder to those who have not contributed to send a check, no matter how small, payable to the Alumni Fund. Just address it to Room 3-219, M.I.T., Cambridge.

Another reminder. If you fellows want this column of notes about members of the Class to continue, write your Secretary a letter, and do that several times during the year. If you leave it to the other fellow, you may be sure that the Secretary will have to follow the same procedure, and there will be no notes. — JAMES A. BURBANK, *Secretary*, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston 9, Mass.

## 1917

In spite of a resolution not to attempt coverage of service promotions in these notes, we obviously cannot pass Heggie's ride to military stardom. It is now Brigadier General Albert F. Hegenberger, once of South Boston and subsequently of many and varied aeronautical activities. The instruments he developed made possible Lindbergh's flight, and his own pioneering of navigated flights in fog and darkness marked major advances. His famous flight to Hawaii with Lieutenant Maitland was the first long overseas navigated flight. He has been given all too little credit in the many general annals of flying progress but has received the Collier Trophy and many other honors, including two awards of the Distinguished Flying Cross.

We must also note the war contribution of the Tech Show. Captain Clark Robinson of show fame, who designed many notable entertainment spots, including Billy Rose's Aquacade, and who is well known on Broadway for theater design and production, is in India. In his capacity as recreation officer, Captain Robinson was found by a roving reporter decorating recreation quarters for officers and men at his station. Another brilliant Tech Show personality who subsequently achieved high rank in related but different circles is Major Paul Gardner. He is on leave from his position as director of the William Rockhill Nelson Gallery of Art in Kansas City. You will recall that in his appointment as director of that gallery he accepted the heavy responsibility of developing from scratch one of the most significant art collections in the United States. He now has one of the most unusual posts in the Army, that of custodian of the ancient ruins and art museums at Naples. His many previous trips to Europe and particularly to the Mediterranean made him well acquainted with Italian treasures and obviously he is well qualified to check up on what the Nazis swiped.

The notes this month were to have been written by Philip E. Hulburd, Wentworth Hall, the Phillips Exeter Academy, Exeter, N.H., but Phil found that Betty and he were to be in New York for their son Bob's graduation from midshipmen's school at Columbia at the time the notes were due. After the graduation ceremonies, Phil

1917 Continued

planned to stop at his summer home at Meriden, N.H., before assuming arduous activities incident to the booming attendance at Exeter.

Phil Cristal's daughter, Molly, is attending the Nursery Training School of Boston on Marlborough Street, Back Bay. — Harrison Prescott Eddy returned in early October from an eight weeks' trip to Honolulu. During his stay there he was guest speaker at a meeting of the Technology Club of Hawaii. Among those who attended the meeting was L. L. Clayton, now a full colonel in command of a unit of artillery presumably located "somewhere in the Pacific area."

We quote from the October number of the *American Hampshire Herdsman*, the professional journal of the American Livestock Publishers, Inc., of Peoria, Ill.: "Neal E. Tourtellotte, Seattle, Washington, had the distinction of sending to the University of Alaska at Fairbanks its new herdsire. This extra good pig was selected by Professor M. E. Ensminger of Washington State College of Agriculture at Pullman. Registered as Janalulu Roller Gene, this spring boar is by Modern Chance bred by Lettow Brothers, and is out of Lady Roller Ede, daughter of Bob Lewis' Pershing Roller Lad."

In proffering the congratulations of the Class, we append a note that they were expressed in person during October when Neal toured the eastern seaboard. En route east, he paused at Chicago, whence usually reliable sources report that Neal and his party were entertained by another prominent classmate in the front row of a prominent night spot (not the Pump Room). Akron and Cleveland were favored next, after which he came to tidewater at the inhibited estuary of the Charles. There the great P. and R. magnate of the Northwest (rose culture being still a minor activity), his beaming countenance surmounted by a specially constructed Cavanaugh chapeau, was met at Huntington Avenue by a religious delegation and ferried to the Copley-Plaza in a beach wagon. Later he recovered sufficiently to be formally introduced to a boiled lobster, which he drowned in California white. The next day he inspected the Institute and partook of a Saturday ration of fish cakes amidst literary surroundings in the Back Bay, and in the evening revisited more of the scenes of his career as an architectural student by dining at the Hotel Lenox before departing Sunday morning for Exeter to see Phil. — RAYMOND STEVENS, Secretary, 30 Memorial Drive, Cambridge 42, Mass. PHILIP E. HULBURD, Assistant Secretary, Phillips Exeter Academy, Exeter, N.H.

## 1918

Thanks to the interest of Carl J. Trauerman '07, Secretary of the Mining Association of Montana, I have news of our old friend W. R. C. Russert. He had been foreman of the Belmont mine but has now been made assistant general superintendent of mines of the Anaconda Copper Mining Company. Russert has been the secretary-treasurer of the Montana Alumni Association of the M.I.T. for the last four years.

Bill Wyer has been named chief executive officer for the trustees of the Central Railroad Company of New Jersey, with

authority over all departments of the railroad. — Frederick B. Philbrick has been made president of the Gamewell Company, with which he has been associated for the last 23 years. For the past 14 years, he has been the Pacific Coast manager of the company. This looks as though Fred will be getting back to the East, where some of his old friends can see him again.

Otto Lorenz has become a women's club speaker. It is announced that he will speak at the Sewickley Valley Women's Club in the latter part of November. The report didn't give the topic of his talk.

The figures I have from the Alumni Fund tell me that, as of September 30, we had 111 contributors, who gave a total of \$1,540. This is 46 per cent of our money quota.

Our old friend Sam Chamberlain is now Captain Samuel V. Chamberlain of the photo intelligence, stationed somewhere in the battle zones. We have our first colonel in the person of Edward B. McCarthy. If anyone else has this title, I wish he would let us know. — GRETCHEN A. PALMER, Secretary, The Thomas School, The Wilson Road, Rowayton, Conn.

## 1919

The returns of the first six months of the 1943-1944 Alumni Fund indicate that on September 30 the Class had 104 contributors, who had given \$1,011. This represents 63 per cent of our quota of contributors and 34 per cent of our money quota. We have a considerable way to go to get up where we belong. We hope those of the Class who have not sent in their contributions will do so, and we hope that those in the Class who are receiving The Review will interest other members in contributing.

Here are some new addresses: Philip R. Brown, 249 North Third Street, Middleport, Ohio; Captain Charles B. Maloy, La Junta Army Air Field, La Junta, Colo.; and Corporal Russell S. Palmer, 116 Stewart Avenue, Garden City, N.Y.

We have just received word of the death of Oscar S. Martinson in the winter of 1942.

Kenneth Coleman, son of Bernard S. Coleman, has just entered the Army Air Forces. — Edith Clarke, of the analytical division, central station engineering division, General Electric Company, Schenectady, N.Y., has written a textbook for students. It is a reference for engineers, with special emphasis on the construction of equivalent circuits and the solution of practical problems in power transmission. The book is called *Circuit Analysis of A-C Power Systems*. It was published by John Wiley and Sons, Inc., New York.

Wayland S. Bailey, Box 37, Norwell, Mass., is a special lecturer at Technology for the duration. Wayland is glad to be back at the Institute but expects to return to Norwell after the war.

The appointment of R. G. Lafean as planning consultant of the planned-estates staff of the Home Life Insurance Company in Pittsburgh was written up in the Pittsburgh newspapers recently. He has been in the insurance business since 1920. He was president and director of the agents association for the Edward A. Woods Company for a number of years. Raymond is a past national president of the Phi Sigma Kappa Fraternity and an alumnus of the University of Pennsylvania.

Archie Tech (W. C. Patterson), Box 349, Waltham, Mass., sends his regards to the Class. — Robert S. Bolan, 195 Soundview Avenue, White Plains, N.Y., dropped us a few lines when he sent his check for war bonds. — Edgar R. Smith writes from Washington, where he is secretary of the Chemical Society of Washington. His home address is 3719 Chesapeake Street, Northwest. He tells of a change of address for W. H. Bassett, Jr., to Major W. H. Bassett, Jr., 4890 Spring Grove Avenue, Cincinnati, Ohio.

Arnold Staubach, 3406 Windsor Road, Austin, Texas, is a bridge-designing engineer with the Texas State Highway Department. — Don't forget to send your bonds in to your Secretary! — EUGENE R. SMOLEY, Secretary, The Lummus Company, 420 Lexington Avenue, New York, N.Y. GEORGE W. MCCREERY, Assistant Secretary, 131 Clarendon Street, Boston 16, Mass.

## 1920

We learned of the death on October 8 of Albert V. Smith, II. This is a loss to the Class in which we all share.

G. R. McNear has been appointed Pacific Coast sales manager of the United States Rubber Company's tire division at Los Angeles. He has been with the company for 10 years. — Murray Whitaker has left Hopewell, Va., and is now in Hamilton, Ohio, at 849 Clinton Avenue. — Livingston Wright is now with the Mutual Chemical Company of America, New York City. His address is Saxon Garden Apartments, White Plains, N.Y.

Here are a few more bright stars to add to our glowing military roster: Aaron Bradshaw is a brigadier general, associated with antiaircraft and coast defense. Fraser Moffat is a lieutenant colonel, at present located at the United States Engineers boat yard in Pascagoula, Miss. Samuel A. Milliken is a major in the Marine Corps and is stationed at the United States Naval Prison, Portsmouth, N.H. — HAROLD BUGBEE, Secretary, 7 Dartmouth Street, Winchester, Mass.

## 1921

It will come as a shock to his many friends in the Class to learn that J. Lewis Hurley, XV, passed away on October 14 at his residence, 45 Tudor Road, Chestnut Hill, Mass. Lew headed his own company, the J. J. Hurley Company, heating and ventilating contractors, Boston. He was born in Jamaica Plain and attended the Chauncy Hall School. At the Institute he was a member of Course XV and captain of the freshman football team. He took particular pleasure in our five-year reunions and was one of the group who attended all of these gatherings. Our sincere sympathy is extended to his family.

Philip H. Hatch, VI, is assistant mechanical engineer of the New York, New Haven and Hartford Railroad, specializing in electric and automotive equipment. He presented a paper to the Toronto Railway Club on "Diesel Locomotives in Freight and Passenger Train Road Service."

On a recent trip to the Middle West, your Assistant Secretary learned that Miles M. Zoller, XV, passed the cigars about a year ago on the arrival of his fourth son. The three older boys are now 19, 16, and 7 years old. Miles is vice-president of the



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Eagle Picher Lead Company, Cincinnati, and has been with the company since 1921. He reports that Zam Giddens, XV, is with the American Locomotive Company, and that Bob Dolle, XV, is in St. Petersburg, Fla. Bob, who also has a young son, still operates a goldfish farm in Cincinnati. Ollie Bardes, XV, Vice-president and general manager of the E. H. Bardes Range and Foundry Company, Cincinnati, had just returned from a California trip and was playing host to Ab Johnson '23 of Muncie, Ind., who was in town on business. In Detroit we talked with Paul Rutherford, VI-A, who heads General Motors labor-relations activities, and Bill Young, II, a lieutenant commander in the Navy, who is the resident inspector of naval matériel at the Vickers plant.

Sydney W. Gould, I, has returned to the Army from his real estate management business and is a colonel in the Corps of Engineers. He has recently been transferred from his duties as chief of the construction control section in Washington and is now commandant of the Army Engineers depot at Albany, N.Y. — William J. Malone, XIII-A, a captain in the Navy, has been assigned to the Norfolk Navy Yard as planning officer. — Sam E. Moreton, Jr., II, a lieutenant in the Seabees, has been ordered to report for training. — Class records show 124 men in the armed forces, with the Army group three times as large as the Navy contingent.

Your Secretaries wish you all the heartiest of holiday greetings. — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, Federal Telephone and Radio Corporation, 1000 Passaic Avenue, East Newark, N.J.

## 1922

It is interesting to note that three of our Class had sons entering M.I.T. last summer. They are listed here with the sons' names in parentheses: George B. Bailey (George B.), Donald E. Walch (J. MacArthur), and Frank T. Westcott (Frank T.). May the record of the sons be as illustrious as was the record of their fathers!

E. W. Hammond and Mrs. Hammond of Los Angeles were in the East in September. We visited the eastern plants of Worthington Pump and Machinery Corporation, and sneaked a few brief visits with old friends. He is still convinced that the industrial future and the climate of California combine to make it the most desirable place in the country. I asked him if he really meant that California has 365 days of sunshine every year. He answered, "Yes, exactly so, and that's a mighty conservative estimate."

The American Red Cross recently announced that Nathan Weed, XIII, formerly associated with the Veterans Bureau in Mineola, N.Y., had been made a Red Cross assistant field director at Camp Abbot, Ore.

John O. Bower, manager of the Texas Petroleum Company, Bogotá, Colombia, has been elected vice-president for 1943 of the Colombian Petroleum Institute, an organization whose membership has increased rapidly during recent years.

Syd Strauss wrote to Bill Mueser sending regards to the gang. He is a sergeant in the Ferrying Command and is located on the

West Coast. He tired of trying to get a commission and enlisted about a year ago in the Air Corps and was graduated from radio school in Kansas City last January. Since then he has made plenty of trips across the ocean.

As the end of the year approaches, your Class Agent, Warren Ferguson, and the scholarship committee chairman, Bill Mueser, urge you to dig down in the jeans for two worthy causes: the Alumni Fund and the 1922 scholarship fund. Such gifts are deductible from taxable income and are definitely anti-inflationary. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company, Inc., 303 West Tenth Street, New York, N.Y. WHITWORTH FERGUSON, *Assistant Secretary*, Ferguson Electric Construction Company, 204 Oak Street, Buffalo, N.Y.

## 1923

President Bob Shaw has appointed George A. Johnson of Auburndale to fill out the unexpired term of Howard F. Russell as class representative on the Alumni Council. George is an insurance broker in Boston.

Ed Pomykala writes that he's in the Navy now, a lieutenant in the Civil Engineering Corps. He joined up in July, has had an indoctrination course at Camp Peary, Williamsburg, Va., and a tour of duty most recently at Camp Endicott, R.I. He is looking forward to further service with the construction battalions. — Charles F. Schell is engaged to Dorothy Flint, daughter of Mr. and Mrs. Albert E. Flint of Braintree. Miss Flint is a member of the faculty of the state normal school at Gorham, Maine. Schell is laboratory director of the South Braintree factory of the Armstrong Cork Company. No date has been set for the wedding.

I am sorry to report the death on January 8 of Albert I. Gould of the department of hospitals in New York City. Gould was a graduate of Course VI.

Your Secretary addressed the New England Water Works Association in Boston on September 29 on "Some Observations on Water Supplies for Air Raid Fires." At this meeting I was pleased to see Fred Almquist of the Connecticut State Department of Health. I had not seen him for some time.

The Secretary gets an occasional letter which makes him feel that the time and effort put on the job are worth while. One such letter was received recently from M. B. Donald of the department of chemical engineering of the Imperial College of Science and Technology in London. He says: "I want to thank you most sincerely for the excellent review of life in England in the July issue of *The Review*. It didn't strike a false note and has left me sorry that I was not able to make your acquaintance while you were over here. With the ration situation we feel that we don't do as much for our American and Canadian friends as we should like, and so it is doubly nice to see such a kind appreciation as you have worded."

I was fortunate to be in Washington at the first fall meeting of the Washington Society of the M.I.T. in October. Dr. Compton was the principal speaker. About half of his remarks were devoted to a report on a recent visit he made to England, and

you will perhaps be interested to know that he made much the same observations that I gave you in July.

Chuck Springer writes explaining his new address in New York: "After 17 years in Cleveland, Mrs. Springer and I were beginning to feel like natives. My two daughters were born there. For the past five years, I have been associated with the Draper Manufacturing Company of Cleveland, the pioneer and one of the larger manufacturers of steel drums. From October, 1941, until last spring, I commuted weekly to Washington and ran into many schoolmates there. On March 1 of this year, I was appointed manager of our New York office at 11 Broadway and took up my duties here. I moved my family east in June, and we are now comfortably settled in Scarsdale."

Ed Roll writes: "I am now located in Trenton, N.J., as treasurer of the Thiokol Corporation, who are manufacturers of synthetic rubber and rubber chemicals. Since leaving the Institute, I have had a varied career — from that of an illuminating engineer with Westinghouse, rate expert with Electric Bond and Share and the Federal Power Commission, and public utility engineer and financial expert with the Securities and Exchange Commission, to power engineer with the War Production Board. During this period my family has lived from Shanghai, where my oldest daughter was born, to New York City, where the youngest was born, and from Boston to Fairfax County, Va., from where the family has just moved to Trenton." Ed gives his Trenton address as 2144 Lawrenceville Road and his business phone number as Trenton 8195. — HORATIO L. BOND, *Secretary*, 457 Washington Street, Braintree, Mass. JOHN M. KECK, *Assistant Secretary*, 207 Bloomfield Avenue, Bloomfield, N.J.

## 1925

The Secretaries have received a letter from the Editor of *The Review* saying that it will be necessary to conserve on paper this year. It is not your Secretary's intention to conserve by omitting notes entirely from any issues, although this did happen in November. I'll try not to let it happen again, at least if the letters and clippings continue to come in.

A note from *Dorco Doings* for June 1 reads as follows: "Major Glen L. Bateman of the So. African Air Force, after 2 years of piloting a bomber in Kenya, is now Senior Air Staff Officer for the Natal Group of Naval Reconnaissance units."

Here is a letter written by Lieutenant Colonel H. C. Trask, who is stationed somewhere overseas, to Captain W. M. Bainbridge '22: "We have an excellent school, although we are terrifically busy all the time. I am chief of the engineering section and have organized and am conducting courses in mines, booby traps, anti-personnel mechanisms, maps and aerial photo reading, sketching, fire fighting, field fortification, water purification, camouflage, river-crossing equipment (bridge boats, floats, and so forth), rigging and lashings, and various other engineer and allied subjects."

"General Andrews was here, and about every other general and big shot in the European theater of operations gets here



1925 Continued

sooner or later. We sure have a great place: brick buildings, good living quarters, fine classrooms, and so on. In addition to my other duties, I am post engineer and post fire marshal. Believe me, I have been busy at Technology in years gone by, but that was nothing to my activity here. I enjoy it in spite of the work, the absolutely strict and rigid regulations, and the total loss of freedom. We never get away. There is no time and no place to go; and if the time and places were available, we have no strength or energy left over." It all sounds like Chet except those last six words!

From Seymour Johnson Field, N.C., comes the following release: "Capt. Roland T. Seabury of No. Weymouth, Mass., has reported for duty at this aircraft mechanics' school. . . . Capt. Seabury has been assigned as commanding officer of a headquarters squadron. . . . He entered active service with the Air Corps on July 21, 1942, at Atlantic City, N.J."

This news item came from Professor Charles E. Locke '96: "Gilbert W. Noble resigned as associate professor of petroleum engineering at the Missouri School of Mines to join the staff of the Ohio Oil Company in their Findlay, Ohio, office."

In the Boston *Post* of August 14 appeared the following item: "The Rev. Robert S. Stansfield of Auburn, N.Y. will occupy the pulpit of the Ruggles St. Baptist Church as guest preacher tomorrow. Mr. Stansfield is well known in Boston as the former pastor of the Blaney Memorial Church in Dorchester and as a popular leader of young people. He is a graduate of the M.I.T. and of the Gordon Divinity School."

This information is taken from a release of the Goodyear news service: "Robert J. Anderson, a native of Cleveland, Ohio, and a former student at the Case School of Applied Science and M.I.T., is one of the Goodyear Tire and Rubber Company's metallurgical engineers who will move next week into Goodyear's big new research building in Akron. After attending South High School in Cleveland, Anderson was a student at Case from 1910-1914 and again in 1917, and at the Massachusetts Institute of Technology from 1924-1925, where he received the degree of doctor of science. He is a member of the British Institute of Metals, the American Foundrymen's Association, Theta Tau, Tau Beta Pi, and Sigma Xi."

"Anderson started with Goodyear in its research department in February of 1942. He has published papers on the metallurgy of aluminum and other metallurgical subjects. He is married and lives in Akron at 275½ South Main Street."

H. Royce Greatwood, a Navy lieutenant, was married to Mrs. Florence Dudley Tobey of Poughkeepsie, N.Y., and Lafayette, Calif. The couple will reside in Silver Spring, Md. Captain Samuel Richard Spiker of the Army Air Forces was married to Elinor Whitney Brown, daughter of Mrs. Mabel Wolcott Brown of Wellesley and Harvard. Mrs. Spiker is a graduate of Dana Hall and Radcliffe College. Captain Spiker is stationed at Wright Field. At M.I.T. he was a member of Phi Beta Epsilon.

The Chicago *Sun* of August 8 reports that John Howard Raftery, formerly with the architectural firm of Frazier and Raftery, has been appointed director of the master

plan of the Chicago Plan Commission. He will be in charge of the group which plans express highways, parks, playgrounds, aviation facilities, and postwar public works projects. The item adds: "Raftery, who was a flyer in World War I, was graduated from Princeton University, took postgraduate work at M.I.T., and studied in France and the American Academy in Rome. His training has featured town planning and for the last 18 months he has been project planner in the design and construction of war housing in the Detroit area. Raftery is married and lives at 1707 N. Park Ave."

On November 1, your Secretary started work as supervisor of job classification at the East Alton, Ill., plant of the Western Cartridge Company. For the time being, until I find a permanent residence, my mail should be addressed care of that firm. I must also report that my 10-year-old daughter Rose died on October 6 after a four-month illness. — HOLLIS F. WARE, *General Secretary*, care of Western Cartridge Company, East Alton, Ill. F. LEROY FOSTER, *Assistant Secretary*, Room 5-105, M.I.T., Cambridge 39, Mass.

## 1926

Giles Hopkins has been appointed research manager of the Textile Research Institute. For many years he was technical director of the Bigelow-Sanford Carpet Company, and for shorter periods he was a chemist with the Factory Mutual Fire Insurance Laboratories, chemical engineer with the research division of the United Shoe Machinery Corporation, technical director of the United States Asbestos division of Raybestos-Manhattan, Inc., and, more recently, chief of the industrial production section of the reoccupation division of the Board of Economic Warfare.

The Washington *Post* reports that Thornton W. Owen has continued as sole proprietor the business of Thomas J. Owen and Son, real estate auctioneers and appraisers, since the retirement of his father last July. Thornton, who represents the third generation in the organization, has been associated with his father since 1931. Prior to that he had been with Sears Roebuck. He is secretary of the Washington chapter of the American Institute of Real Estate Appraisers and a member of the Society of Residential Appraisers, being a past president of the Washington chapter. He is a director of the Perpetual Building Association, the Fidelity Mortgage Investment Company, a member of the advisory board for branches of the American Security and Trust Company, and a member of the board of directors and the executive committee of the Washington Board of Trade. He is also a trustee of the Better Business Bureau, a past director of the Washington Real Estate Board, and past trustee of the Washington Community Chest.

E. B. Godley writes that he has recently become project engineer for the Zenith Optical Company in Huntington, W. Va. The instrument division of this company is manufacturing optical devices for the Army and Navy.

We have heard that Brigadier General W. A. Danielson, who was commanding general of the Army Service Forces depot in Memphis, has been transferred to Colum-

bus, Ohio, where he commands the depot there.—JAMES R. KILLIAN, JR., *General Secretary*, Room 3-208, M.I.T., Cambridge 39, Mass.

## 1931

We have received a note from Charlie Martel to correct an error in our column of last May. We listed him as married, whereas he was engaged at the time. The marriage took place in Hillsboro, Ohio, on Sunday, June 20. Mrs. Martel was formerly Mary Scott Tolle. Charlie is at Wright Field as a lieutenant in the Signal Corps.

An interesting letter from A. R. V. Arellano to Sergeant Patrick J. D. Harnay was passed along by Professor Charles E. Locke '96. Pat was detailed temporarily on some work at M.I.T. but expected to leave Cambridge some time in July for work in the field. Arellano is a geologist and is located in Mexico City. His address is Apartado 7527, Mexico, D.F. He writes: "Your letter came to my hands as preparations were being completed for a trip to Sonora, our second from biggest state and closest to Arizona. In fact, Sonora borders it for a longer stretch than your legs could carry you in a month of moons. I accompanied on this expedition Dr. G. A. Cooper of the United States National Museum, a crack fossil hunter, and our mission was to study the Paleozoic section in that part of the world and to collect a suite of specimens, which were to be studied at the museum and later divided between the museum and our Instituto de Geologia. Our expectations were fulfilled in the highest sense, and a beautiful collection of trilobites and other ancient brutes were sent to Washington."

"We moved into Mexico City from Tampico almost three years ago and have been having a hard time getting established in private practice, but I seem to be getting there slowly. Most of my work is now on mines; nevertheless, my training in oil geology has been extremely valuable. There is an old Mexican song which says that one always goes back to an old love, so maybe sometime I'll return to my old petroleum. Don't fail to let me know of the big things you are doing, and may we meet in good spirits, at least."

Ensign Alice Richmond Stewart of the WAVES became the bride of Lieutenant Arthur C. Nisula in New York City last June. Both were with the Navy Bureau of Ordnance in Washington, D.C. From Washington also, we hear of the appointment of Francis A. Gregory as principal of the Armstrong Technical High School. He was formerly principal of the Phelps Vocational School of Washington.

Carrington Mason has been commissioned a lieutenant, junior grade, in the Naval Reserve at Houston, Texas. Mason was with the Buckeye Cotton Oil Company, chemical pulp division, prior to entering the Navy and was living at 1629 Carr Avenue, Memphis, Tenn.—BENJAMIN W. STEVERMAN, *General Secretary*, 9 Graham Terrace, West Roxbury 32, Mass.

## 1932

More and more these notes bring news of classmates at war. Because the space available is limited, we shall maintain a telegraphic style, which will insure men-



1932 Continued

tion of as many classmates as possible. Lieutenant Colonel Gordon K. Parks, VI, of Cheshire, Conn., was killed in action in the South Pacific on October 8.—Captain Frank Speir, an engineer in the Allied amphibious command, gave an Associated Press correspondent a ride from Sicily to Italy in a "duck." He had been assigned to the British Eighth Army in connection with these "ducks," which are long six-wheeled boat trucks. They carry about four tons of cargo and average six knots in a moderate sea.—Frederick J. Eimert, who is with Army Ordnance at Camp McCoy, Wis., was recently promoted to the rank of major. Arthur J. Seiler, XV, chief of the industrial division of the Philadelphia Ordnance District, is now a lieutenant colonel.

Earle F. Hiscock, a lieutenant commander in the Coast Guard, became engaged to Alice Morgan Carson of Greenwich, Conn., in September. He is in the Navy's Office of the Coordinator of Research and Development, Washington. Richard T. Craig, who is associated with the Aluminum Company of America, has been transferred from New Kensington, Pa., to Phoenix, Ariz. He will be a supervisor there. F. Rolf Morral, former assistant professor of metallurgy at Pennsylvania State College, has become a fellow at the Mellon Institute of Industrial Research, Pittsburgh. T. Avery Chadwick, IV, has been appointed an instructor in graphics at Dartmouth College.—The rest of the notes come from Assistant Secretary Kirkpatrick.

Some time ago we located Bill Holst after losing track of him for a couple of years. He's back in this country after leaving Palembang in the Dutch East Indies shortly before the Japs took over. Bill is married now and is with the process-engineering division of the Standard Oil Development Company in Elizabeth, N.J. His home is at R.F.D. 3, Sterling Road, Wetchung, N.J.

From Bob Semple's business associates we learn that he's really making fine progress with the Monsanto Chemical Company. He's married and has one or two children. When last heard of, he was assistant director of development at Monsanto in St. Louis, and was doing extensive traveling. He spent some time last year in Brazil.

In 1938, Bob Emerson married Dorothy Schreiber of Urbana, Ill., and Simmons College. They live at 34 Theresa Place, Grymes Hill, Staten Island, N.Y., and have two children. When we saw him, he was with Louis Dejonge and Company and was engaged in the development of war products in the paper field. Recent word has come that he has changed from the paper industry to the paint industry in New York, but we have no details.

Several months ago we heard that Earl Anderton was a Navy lieutenant, junior grade, stationed at Edgewood Arsenal, Md. He is married and has one child. Earl used to be with the Scott Paper Company as assistant control engineer and lived in Media, Pa.

Ed Poor claims to be "still enjoying" (?) single bliss. He is technical director at W. C. Hamilton and Sons of Miquon, Pa., paper manufacturers. We see both Ed and Bob Emerson occasionally at meetings of the Technical Association of the

Pulp and Paper Industry. Bob McCarron '30 is also usually on hand at these meetings. He is with Stein Hall and Company, Boston, doing technical service work. He lives at 30 Frederick Street, Newtonville.

The last word we had on Don Fettes was that he lives in Berwyn, Ill. He is married and has no children. He's in building construction with his father in Chicago. The last we heard, Don Gilman was also still in Chicago. He was with the personnel department of Sears Roebuck and Company.—Colonel Kellogg told us recently that John Crowther is back on active duty as a captain in the Chemical Warfare Service. Let's have a note from you, John!

Let the rest of us know what you're doing. You may be working right next door to a classmate and don't know it, so why not drop a line to Chippy or Carroll or Bill and bring your old friends up to date on your doings.—CLARENCE M. CHASE, JR., *General Secretary*, 1207 West 7th Street, Plainfield, N.J. WILLIAM A. KIRKPATRICK, *Assistant Secretary*, Allied Paper Mills, Kalamazoo, Mich. CARROLL L. WILSON, *Assistant Secretary*, 1530 P Street, Northwest, Washington, D.C.

## 1934

Come June we shall have reached the ten-year milestone, and that brings up a question which calls for a popular vote. Here is the problem: We are going to have a reunion of some kind, but there is a choice of two dates on which it may be held. With the accelerated program now in force at the Institute, Alumni Day is scheduled for March 4. If we hold our reunion then, it will probably consist of a luncheon at one of the Boston hotels, previous to the exercises at Technology. The alternative is to hold our reunion in June at a resort hotel, possibly along the Maine or Connecticut shores. The first alternative has the advantage of combining our reunion with the Alumni Day program, but it would limit our activities to a very short meeting. The second alternative would give us an opportunity to spend a week end together and have the same kind of celebration we had five years ago at Plymouth. It would, of course, have the drawback of not coinciding with the school's program. Well, there is the problem, and it is up to the members of the Class to voice their opinion. Will each and every one of you drop me a card stating your preference. Be sure to do it now before it slips your mind.

And now for news of our fellow classmates. The Rev. Joseph A. Hahn, M.M., is a member of the Pennsylvania Aeronautic Patrol. Father Hahn is a science professor at Maryknoll College, Clarks Summit, Pa. He is the only member of the Institute of the Aeronautical Sciences who is a priest. He was formerly a professional airplane designer and has done special research in the field of dirigibles.—Louis Frank has been promoted to the rank of major. Since March, 1941, he has been assigned to engineering and production activities in the Army Air Forces matériel command at Wright Field, Ohio. He was first a project officer on training and transport planes, but recently was appointed technical executive for the production engineering section at Wright Field.

Lieutenant Commander Foster R. Jackson, who joined the Navy before Pearl Harbor, is now an executive officer on a submarine. Major W. Randolph Churchill of Jackson Heights was named executive assistant to the director of training at Camp Santa Anita, Arcadia, Calif.—Lieutenant Commander James H. Kimberly has been appointed assistant chief director of the Coast Guard Auxiliary in Washington, D.C. The Auxiliary is an organization of about 40,000 men and women, owners of boats from 18 feet to the largest yachts. They work 12 to 24 hours a week without pay as anything from cooks to officers, in order to relieve the men in the Coast Guard for active duty. Since Jim took his present job, he has toured the country several times organizing these auxiliary units. There are three Kimberly youngsters back in Wisconsin.

Frank Milliken has at last joined the ranks of the benedicts. On September 21 he was married to Elizabeth Caroline Phillips of Seattle, Wash.—John Burroughs, 2d, a lieutenant in the Coast Guard, is engaged to Annis Elizabeth Reed, daughter of Captain Allen B. Reed, United States Navy, retired, and Mrs. Reed of Washington. John entered the naval architecture division of the Coast Guard three years ago and is now at Coast Guard headquarters.

Be sure to put the card in the mail expressing your sentiments on the date of our reunion. Do it immediately, so that your conscience will not bother you.—JOHN G. CALLAN, JR., *General Secretary*, 184 Ames Street, Sharon, Mass. ROBERT C. BECKER, *Assistant Secretary*, Special Service Force, care of Postmaster, Seattle, Wash.

## 1937

Announcement has been made by Gustav Egloff, the director of research of the Universal Oil Products Company, of a new fuel for United States planes. Inventors of the process are Vladimir Haensel and Professor Vladimir M. Ipatieff of the laboratory headed by Dr. Egloff. This new aviation fuel can be used now as a blend up to the capacity of aviation engines to withstand its terrific pressure, but it contains so much power that to use it at maximum, engines will have to be redesigned. This blend should increase present airplane engine capacity by 25 per cent. By extending the capacity of the planes, it would enable them to fly with heavier armor to withstand antiaircraft guns, or to fly higher, faster, or with greater bomb loads, as determined by combat forces. This is certainly a great achievement, and the satisfaction that comes of accomplishing a deed of this magnitude for your country in its immediate need of any improvement which will help lead us to victory must be felt by both Haensel and Ipatieff. Our heartiest congratulations to all those who participated in this enterprise.

Herbert Shuttleworth, who is in the material control section of the procurement division of the Jeffersonville Depot, Ind., since reporting for duty on July 11, 1942, has been promoted from first lieutenant to captain, according to an announcement issued by Brigadier General Allen R. Kimball, commanding general of the Army installation.

The engagement of Alfred Nordstrom and Margaret McCarthy was announced in

1937 Continued

October. Nordstrom is a chief specialist in the Naval Reserve. — Walter L. Hughes, Jr., and Betty Ann Kusters have announced their engagement. Hughes received his doctor's degree at Technology after being graduated with us, and is now a research chemist in the department of physical chemistry at Harvard Medical School. A spring wedding is planned.

Word has just been received of the death of Major John Gander at Aberdeen Proving Ground on October 10. Details are not available at this time. — WINTHROP A. JOHNS, *General Secretary*, 34 Mali Drive, North Plainfield, N.J. PHILIP H. PETERS, *Assistant Secretary*, 159 Glen Road, Wellesley Farms 82, Mass.

## 1940

Ensign Edward George Pollak, who had been reported missing since June, 1942, was reported a year later to be held as a Japanese prisoner. This is certainly encouraging news to those of our Class who remember him, and we join with his parents in renewed hope for his safety. Ensign Pollak was attached to the Cavite naval base and later served on Bataan. His parents believe he was on Corregidor.

Robert A. Parent received his majority last May after being transferred to the port of embarkation in Brooklyn. He is, at the age of 25, certainly one of the nation's youngest majors. — Karl W. Melville has completed basic training at the submarine school in New London, Conn. He is an electrician's mate, second class. — Captain Harry Orpen, since being graduated from Kelly Field in 1941, has been connected with the flying training command and with advanced student pilot training. He says he has seen William T. Green in Hollywood several times. — Homer J. Wood reports that he has been project engineer on aircraft and tank engine developments at Menasco and Kinner and did some redesign and testing on the M4A1 tank engine installation. He is with the AirResearch Manufacturing Company. — Jorge Echarte y Romero has been working in Cuba since leaving Technology, and he is now assistant to the chief engineer in the Cuban branch office of the Frederick Snare Corporation. — Captain Fred Noonan, when last heard from, was with the engineer amphibian command at Camp Edwards, Mass. — Robert H. Levis was with Owens-Illinois Glass Company as research engineer until several months ago, when he was commissioned in the Marine Corps Reserve.

Many of the graduate students of our Class have been heard from recently, and they too are leading busy and interesting lives. Lieutenant Colonel John R. V. Dickson, ordnance officer for the advanced echelon of the Fifth Air Force, recently flew into Washington to make a secret report to General Henry H. Arnold. His 9,000-mile flight consumed only five days. Just prior to the Bismarck Sea engagement, Dickson, known as "Deadeye," was charged with developing, testing, and manufacturing a four-second delay fuse for bombs. He completed his assignment just 48 hours before the Jap armada was sighted beating its way down from Rabaul. While all forms of bombing were used in the Bismarck Sea fight, Dickson's skip-bombing fuses are given much of the credit for the complete victory. — Paul E. Auger has

been acting as geologist for the Quebec Bureau of Mines. Dr. Auger has also been teaching economic geology at Laval University in Quebec. — Lieutenant Colonel Robert F. Seedlock has been stationed in several Army camps and is now overseas. — Lieutenant Commander Joseph E. Dodson has been working on major overhauling facilities which have been installed at advance bases in the South Pacific.

A letter arrived from Hurley Bloom, now a Navy lieutenant, from across the Pacific. He wrote: "My job as Course IX Secretary is getting less and less practical, with my headquarters shifted to this South Pacific isle. You will probably hear most of the news long before I do [he doesn't know how you guys love to write], but if any of the boys feel like writing letters, even though my previous efforts to get news out of them have not been too successful I sure would be happy to hear from them."

"En route to these parts I ran into Allan Schorsch '38, Bill Compton '41, and Gordon Brown '43. All look well. Schorsch has a snapshot of his offspring (who so far does not know daddy) looking at a portrait of Al and making a horrible face!"

Eleanor Maclaren Jenkins and Francis B. Hildebrand were married on September 18; and Virginia Cavender and Bob Grosselfinger were married on June 26. That Cavender-Grosselfinger wedding sounds as if it might have been a Technology reunion, with Krieger, Braunlich, Wiley, Meier, Smith, and Schnorr all present. Edith Crosby and Theodore A. Edwards were married on October 9.

Jack Berges' wife sent in a report of Jack, which tells of his working first for Babcock and Wilcox Tube Company and for American Cyanamid, and now being a first lieutenant in the Ordnance Department. He has been in North Africa since January. He was apparently in the thick of things near Gafsa, Bizerte, and Mateur. Before he left, the Phi Gams had quite a convention in Washington. Those present included Martinez, Bruckmann, Hardway, Guething, and Sandt. — Joe Havens is now stationed at Haverford College in Pennsylvania, studying relief and rehabilitation work for northern and central Europe. He speaks of seeing Paul Witherell at Windsor Locks, Conn., last April. Paul is now a captain and has probably left for overseas. Joe sends his regards to the other members of the Class. — Captain Paul Bollerma is married and has a baby daughter. He is stationed at the ordnance unit training center, Flora, Miss. He apparently does not have an opportunity to see anybody in the wilds of Mississippi. He tells of hearing from Herb Holloman and from Jim Fifield, who is apparently going into the Navy. Herb is living in Newton Center, as he is stationed at the Watertown Arsenal. Brad Dewey is now with the Chemical Warfare Service at Edgewood Arsenal, Md. Jim Warden's mother tells of his being in the submarine service of the Navy.

Jim Moore after graduation worked for the Aluminum Company and was called to active duty on June 1, 1942. He was recently married to Beverly H. Bridge of Concord, N. H., and is at present stationed at Jackson, Tenn., doing pilot training. — Bill Green is now working for the Vega Aircraft Corporation at Burbank, Calif. When he started out there, Don Cole, who is now a

captain in the Army, was also working for Vega, and Harvey Brown, Lindblom, Alberti, Pickett, Livingston, Merrill, and Prince were working for Lockheed. The majority of them are still working for Lockheed. Bill Green started off on the drawing board and then went into shop-liaison work. He is now in the flight test section, where he is enjoying his work very much and is finding out how much he did not learn at the Institute. He points out the interesting fact that his superiors are Gene Rohman '33, B. A. Martin, Jr., '36, J. B. Kendrick '34, and Mac Short '26 — all of M.I.T. He extends a cordial invitation to any of the Class to look him up. He and his wife and daughter live at 3319½ Griffith Park Boulevard, Los Angeles, Calif., where they have an extra room for a guest or two.

Lieutenant Al Ackerson was graduated from the Army Air Forces weather school in Grand Rapids, Mich. He studied meteorology there, and although he would have preferred to be at Technology, he did meet his wife in Grand Rapids. He was married on July 24. He tells of Bob Stocker's being a first lieutenant in the Ordnance Department at a desert training center in California. Jeanne Pearlson was married to Bernard S. Silverstein in June, 1942, and is at present a statistician at the Federal Milk Market Administration in Boston. Halvor Strandrud is married. He is a second lieutenant in the Signal Corps. He was formerly a design engineer for the Westinghouse Electric and Manufacturing Company.

Lois Wilson Worley is now Mrs. Frederick L. Langhorst and has a 10-month-old daughter. She and her husband are working on war housing in San Francisco and are living in Berkeley, Calif. — Dick Goodell has been in the Army since April, 1942. He received his bombardier wings in August. Previously he was production apprentice for the General Chemical Company and then an industrial engineer for R.C.A. — John Lutz is working for the North Carolina Shipbuilding Company, where John Strohbeen, Dick Falls, Elwood McGee, and Schrade Radtke either have been working or are now working. Until recently, Karl Feters was assistant professor of metallurgy at the Carnegie Institute of Technology. He is now with the Youngstown Sheet and Tube Company in Youngstown, Ohio. Margaret Dienes of our Class had been his research assistant. He is also secretary of physical chemistry of the steel-making committee of the American Institute of Mining and Metallurgical Engineers. — T. E. Dinsmoor was married a couple of years ago and is now stationed in Newport at the torpedo station. He says Bob Dorsey is working with him at Newport, and Freddie Noonan is working for Army Ordnance in Washington.

James Brewster is married, has two sons, and is living in West Hartford, Conn., where he is senior aeronautical engineer of the research division of the United Aircraft Corporation. Al Castle worked for eight months for Eastman Kodak and was then drafted. After completing a cadet training course, he received his commission and is now in charge of planning and scheduling all photographic procurement for the Air Forces. He is a captain and is stationed at Patterson Field, Fairfield, Ohio. He was



1940 Continued

married last May to Adele Grimes of Dayton, Ohio. — In the next issue we'll include more of the information received from the Alumni Fund replies. — H. GARRETT WRIGHT, *General Secretary*, 1124 Greenwich Street, San Francisco 9, Calif. THOMAS F. CREAMER, *Assistant Secretary*, Room 7, 1901 Constitution Avenue, Washington, D. C.

## 1941

The following news of a '41 man who is doing a fine job at the Philadelphia Navy Yard, although long expected, came as a pleasant surprise to us: Ensign Daniel Reid Weedon, Jr., is engaged to Barbara Jenks. — We have learned via the Boston press of Clara B. Cook's engagement to Henry G. Bartlett. Patricia McDonald and Ensign Ben King Duffy are planning something along the same line. Betty Bryson is engaged to Ray Foster. Ray is wearing a set of Army railroad tracks.

Couples more advanced along the marital front include Captain Leo Alpert and Marianne Sheftan. Alpert had to go to Guatemala City to meet his bride during off-duty hours from his weather research division. Art Arguedas, from whom we've heard very little, was married to Dorothy Claypoole of Forest Hills, N.Y. Art is with the General Electric Company in Schenectady. The chapel at Fort DuPont was the wedding scene of Virginia Reynolds of Gloucester, Mass., and Lieutenant Edgar Smith. Viola Drooz became Mrs. Julius Albert Kohn on September 11 at Schenectady, N.Y. — Our best wishes to all.

Bob Parry, who was with Boston Edison for some time, has just been commissioned in the Marines, after being graduated from the base at Quantico. Lieutenant Bertram Brown has just completed a course at the Chemical Warfare Service school at Edgewood Arsenal. Have heard that Norm Shapira, now a major in the Chemical Warfare Service, has left Edgewood and is stationed a bit farther south. Pete Horton has received his railroad tracks. He is in a dive-bombardment group at Salinas, Calif.

Harry Wasserman writes from deep dark Africa something about Egyptian dancers and mermaids. The lad was raving, we are sure, but there is little one can say in a letter from Africa. For instance, Bob Alfred and Burch Berman say little, and, for that matter, other '41 men in Africa say nothing. It is our belief that if those who have received the Purple Heart can find time to write, then a few others ought to come through. Wasserman wrote that Elliott Shaw is working at the Squibb Institute for Medical Research in New Brunswick, N.J., and that he met Charley MacKinnon '39 "over there." A letter came in from Captain Rog Finch, who is at Chanut Field in a weather school.

Herman Affel is listing Washington, D.C., as his address now. Meanwhile, Bill Baade has come closer to Uncle Sam by adding "private" to his name. He is working in a field hospital. When last heard from, Bruce Beard was a lieutenant in a casual battalion at Pittsburg, Calif. Lieutenant Leon Crane was with the Midwestern Procurement District in Kansas and is now in Seattle, Wash. Private Charles Core can be reached through the A.P.O. in San Francisco; Lieutenant Dick Engleman is in Washington; Frank Gandola is now a

Navy lieutenant in the Pacific; and Bob Haslam is an ensign. Bill Hope, George Hite, and Lieutenant John Porter are at the Institute. Dick Knapp is a lieutenant at the Boston Navy Yard; Anatole Kopp is Private Kopp; Muller Moody is a lieutenant in the Navy; and George Moxon is wearing the Army's gold leaves. Joe Myers and Jake Nolen, both captains in the Army, and Harry Rodin, a lieutenant in the Navy, are still signing the monthly pay voucher.

I picked out a piece in the paper which made me catch my breath. We hope things have turned out O.K., but as it stands, Frank Jerome has been reported missing in the Southwest Pacific. Frank was on the staff of an air-borne aviation battalion of engineers. He was married in June, 1942, to Charlotte Peter of Lakewood, Ohio. We send Frank's family and wife our most sincere wishes and earnestly hope that they will receive good news in the near future.

The first bit of information concerning Bill Doughten's death on July 10 in Sicily contained little background. We are expecting to receive additional information which will enable us better to piece the picture together. Bill was the first '41 man to lose his life in the European invasion and has been posthumously awarded the Order of the Purple Heart.

Assistant Secretary Johan Andersen sent in a note to say that Joseph Gavin, Jr., a lieutenant, junior grade, was married on September 27 to Dorothy Dunklee of Brattleboro, Vt. The Gavins are now living at 4210 36th Street, South, Arlington, Va. — STANLEY BACKER, *General Secretary*, 46 Bicknell Street, Dorchester, Mass. JOHAN M. ANDERSEN, *Assistant Secretary*, Hopkinton, Mass.

## 1942

From Officer Candidate Charlie Magdsick, XV, who is no doubt a shavetail for the Ordnance Department by now, comes word of various and sundry people: "Dick Meyer, a first lieutenant, and his wife are doing fine in Detroit, where Dick is working for Army Air Forces procurement. Saw them and partook of Mrs. Meyer's excellent cooking while I was on the way to officer candidate school. Dick is closely tied up with some of the Army Air Forces' new ideas and equipment, and, all in all, leads a most interesting life. He has a lot of responsibility, but it is a cinch for a XV man to handle, of course. On a rare break from school, I saw A.C. (the live wire) Jealous in Washington a while back. Carl was leaving the Naval Ordnance Laboratory for a job in Oak Ridge, Tenn. He's still unmarried but eagerly playing a narrowing field.

"Last I heard Robert Close was an ensign in Washington at the Bureau of Aeronautics. I have made several large-scale attempts to establish communications with that wolf of all wolves, jive-happy Ed Yoder, my ex-roommate. The net result was one short letter from the cliff dwellers of South Charleston, W.Va. It seems that Harry Knox and Blakeslee are still in existence and that an extra room has to be put on the house every so often to take care of the beer. Ed is batting around the country opening new plants for the Carbide and Carbon Chemicals Corporation. He should be a pretty hot plumber by now. . . . I had charge of a research section at

Republic Steel after graduation and from there went to the Naval Ordnance Laboratory in Washington. I resigned and volunteered for the Army, hoping to take up where bad eyes stopped me in senior year of R.O.T.C. The Army ignored my experience, and for quite a while I spent a wild and woolly time with the combat engineers. I'm now in the ninth week of Ordnance officer candidate school, and will come back for three more months of specialist training if commissioned. Much of our starting class has already been washed out, but, as we say, 'Oh well, O.C.S.'

"Some afterthought news has come via Dick Meyer. Frank Seeley is doing an excellent job as Navy liaison officer at Wright Field. He is the only man in existence who knows where all the light switches are located there." [This letter was written several months ago. — Ed.]

From Bill Denhard, VI, who leads a way hard to follow, comes a word or two of his existence: "With the nomadic life I lead, I find it hard to keep up with the fellows. I'm testing railroad track for Sperry Products, Inc., in an effort to prevent rail failures and subsequent train wrecks. Since I live on the test car, I travel with it, and am usually in a different town every night. I've been on a seven-day week, so my correspondence has fallen off. I did meet Bill Van Nostrand, an ensign, in Charlotte, N.C., where he works, or rather is stationed, as an inspector in a war plant. We had a minor reunion of our own with the help of two North Carolina beauties, both promoted by Bill. It seems that we are both foot loose, as yet. Fred Gander sends a card from San Diego once in a while. I am still waiting to hear from Jack Loveland and Dick Gibson."

From Bob Ely, a first lieutenant, formerly somewhere in Africa with the "grass-hoppers" of the Field Artillery, comes word of what is happening over yonder: "Friday, the 13th, seems like an appropriate day to scrawl a few lines. The June copy of The Review reached me the other day and reminded me that I have been considerably lax in my communications. However, I noted that, thanks to that Beau Brummel of Newport News and Washington, I made the May issue. The story on Tom Crowley was good to read, and I might add that I have traveled some of those Crowley-cleaned roads both in Sicily and in North Africa and have not worried much, knowing that a member of the illustrious Alumni was in charge of the work. As yet I have not run into Tom over here, but a member of his outfit back in Oran said that he had been awarded the Silver Star and was a captain.

"I had a grand reunion at Nemours, North Africa, with Lieutenant Joe Larkin, who is a fraternity brother of mine. He was the first Ranger on shore in the Arzen sector last November, and has seen lots of action since. My activities in North Africa consisted of acting as a flight instructor at the grasshopper school in Sidi-bel-Abbès. You may have read about it in 'Wing Talk' in *Collier's*. However, since crossing the *Mare Nostrum*, things have been much different. When I came over, I was amazed to find as cabinmates Chepulis, Devine, and a third '42 man whose name escapes me. With four Technology men in the cabin, the lone Princetonian said little.



1942 Continued

"One of my instructors while I was taking the grasshopper course (liaison pilot training), was Lieutenant Piper, son of the man who builds the 'Cubs' we use. He was a Harvard man but a swell chap in spite of that. Bill Morton is now a first lieutenant in the Army Air Forces and is navigating heavy bombers on conducted tours of the Middle East. See you at Jake's."

From Fred Sargent, IX-A, in Brookline, come reprimands for past communiqués not acknowledged. Many humble pardons; we'll do better in the future. Fred wrote: "I am still at Harvard. I dropped graduate work last fall, then decided to go into medicine. I have been admitted to the December, 1943, class at Boston University School of Medicine. I have been accepted into the Naval Reserve class SV-12(s), and am now volunteering for induction. Once I am sworn in, I shall be allowed to go on inactive duty to continue my work at the fatigue laboratory until medical school begins."

"My research at the fatigue laboratory has been mainly in the field of nutrition. I have been doing considerable vitamin and protein-requirement work. Last summer we did a study on a group of conscientious objectors in New Hampshire. That study is just being completed. I have also been a tutor in the biochemical sciences since October, 1942. Mrs. Sargent is nutritionist for the town of Brookline."

Looking through the long list of classmates in khaki or blue, we find the following: Dick Hughes, X, a lieutenant with an A.P.O. number, doing ordnance work for the Army Air Forces; Bill Hahn, II, a lieutenant with a maintenance battalion, also with an A.P.O. address; Lieutenant Bob Fay, XV, with an anti-aircraft outfit at Camp Edwards, Mass.; Lieutenant Ed Edmunds, X, flying with the Glenn L. Martin Company, Baltimore; Dick Russell, III, at the Watertown Arsenal; Lieutenant James Sawyer, I, with an A.P.O. number care of the Corps of Engineers; Bob Sandt, II, an ensign, caught in the Washington whirlpool; Colonel J. H. Rothschild, X-A, at the Chemical Warfare Service laboratory at Technology; Ensign John Rothery, VI-C, also in Washington; and Ensign William Knapp, XIX, at the naval training school at New York University.

Looking farther west, we find Bill Schoen, XVI, a first lieutenant at an Army Air Forces subdepot in Frederick, Okla.; Bob Secord, V, a lieutenant in the Coast Artillery, with an A.P.O. address; Leslie Slack, VI, a lieutenant commander aboard one of our newer battleships; Ensign Pearson Stewart, IV-B, with a fleet post office address; Lieutenant Brad Torrey, XV, at Drew Field, Fla.; Dave Whitcomb, XVI, a lieutenant, still at the Wright Field aircraft laboratory; Ken Leghorn, an Army captain; Lieutenant Jack Arend, XV, taking flying instruction at Selman Field, La.; Bill Avent, I, an ensign with the C.B.'s, somewhere overseas; Lieutenant Gene Brady, with the Corps of Engineers, at Cowen Field, Idaho; Jack Whelan, X, a lieutenant at the Chemical Warfare Service replacement training center headquarters, Camp Sibert, Ala.; Lieutenant Bernard Levere, I, and Lieutenant Edgar Wise, V, overseas with the Corps of Engineers; Hank Titzler, XVI, also a lieutenant, about to leave the aircraft laboratory at Wright

Field to start pilot training; and Carl McGinnis, a flying ensign for Uncle Sam's Navy in Florida.

From the home front comes word that Frank Seeley is now to be addressed as "Pop."

Lieutenant Frank Conant, VII, United States Marine Corps, who is buzzing around Jacksonville, Fla., in something with two motors on it (that's the best information to date), wrote: "I've been here in Jacksonville for a month and a half, ever since receiving my wings, and will stay until the good old Marines 'weaken' and give me a 15-day leave—the first in six months. Then it's off to Cherry Point, N.C., and then perhaps off to lick the Japs, Germans, and any others in the way. I've been flying the big Navy planes for three months."

"Recently I received word that Ben Skinner was being married to Angela Marie Gottfried of New Jersey. Old Walt Kneeland is now working hard in Lockport, N.Y., as a chemist for a food concern and is doing well. He is engaged to Dorothy Walters of Melrose. Lawson Bowers, another food man, is fighting with the Navy as a deck officer. He was in Africa at last report."

"Ernie Kenyon was (I say 'was' because I haven't heard from him for nearly six months) working in the food laboratories at Technology for the Army. He was a second lieutenant. About eight months ago, Milton Kaplow was a civil service food-plant inspector; ditto Fagerson. Alan Katzenstein is an Army boy, but his whereabouts I know not." Thanks loads, Frank. — Four or five letters like that every month and your Secretaries would soon look like satisfied Cheshire cats.

From Heinie Shaw, XVI, who has done some superscouting work for your Secretaries of late, comes the following information about many people: "I was at the Curtiss-Wright plant recently on a job and ran smack into Leo Wilson, whom I hadn't heard hide nor hair of since April, 1942. He was nosing around the experimental hangar when I ran into him. His job at the Columbus plant is with a flutter-research group, although he does put in time at some of the other Curtiss-Wright plants. He is about the only one at Columbus who knows anything about the subject and is occasionally on demand at the other plants, too, where he also picks up information to take back home with him. Leo says he keeps in rather close touch with his old buddy Dick Heldenfels. Dick has been a captain since about the middle of August. He is working at Wright Field in Dayton, Ohio."

"Redheaded Charlie Kennedy is in flutter work also, and draws his pay from Curtiss-Wright. He hangs his hat in a Buffalo plant. Charlie worked quite a while with Professor Manfred Rauscher '26 at M.I.T. before signing up with Curtiss. He is now in charge of a group doing flight-flutter tests. He still has the old bike and rides it faithfully to and from work. No flats yet—well, not too many."

"Another Course XVI lad was trapped while looking one way and walking another. The girl with the butterfly net was Jean Marie Carey of Pasadena. The late bachelor was none other than Jesse Van Wickel, who put up his last futile battle for

freedom last August 29. Jake Shaw and Muffin Mangan (Simmons '43) are well on the way, if it hasn't happened already."

"A little over a week ago at a dinner party held by Pratt and Whitney Aircraft for the officers attending their 100,000th engine celebration, I ran into none other than Ed Edmunds. Ed, a lieutenant in the Army Air Forces, was chosen, along with Cap Adelson, to do test flight work. Cap, you know, was killed at Wright Field in July."

"Several weeks ago from Navy Bureau of Aeronautics, Washington, came Bob Chappelle, a junior grade lieutenant, to discuss propeller problems. He is in the propeller unit at the bureau and seems to act as buffer between the Navy field activities and the propeller manufacturers. He is married, by the way. [Sec. — How about that now? Who is the lucky gal, Bob?] Larry Beckley is at the Bureau of Aeronautics, working with the structures group. Of the three lads who went to Miami with Pan American, Ron Shainin is the only one I hear of. He was put through the flight engineers' course and is now taking six or eight trips abroad per month."

Ensign Carl McGinnis, X, is still flying for the Navy. He was last heard from preparing to start carrier-landing training on Lake Michigan, and was looking forward to a spot of leave after finishing training there. Lieutenant Donn Barber, X, writes of much contemplation regarding a 15-day leave "back to the States." He says: "After that I'll be able to come back here and rest for about ten months till my next chance. Life in Bermuda goes on its own censored route. I manage to keep plenty busy and still know enough to come in out of the rain, which is plentiful. As for Bermuda itself, there are red, blue, yellow, orange, and coral houses; roads allowing trucks about two inches clearance; the same roads with ruts a foot deep in places making for comfortable (?) jeep riding; beautiful blue water in every direction; and palm trees."

"Earle Foote, after getting his lieutenancy in the Marine Corps, headed for Harvard and Technology for a six-month grind with electronics. I shall see him while I'm home. John Lacy is an engineering officer on a carrier. That must be an interesting job. He seems very happy and is working hard."

Captain Curt Buford, I, writes vividly of a whirlwind leave that covered most of the United States in a very few days. He spoke of some good times in Seattle with George Watters, a lieutenant, junior grade, before he went back to nature in the great Northwest. See you again next month on this same station. — FREDERICK W. BAUMANN, JR., *General Secretary*, Orchard Lane, Golf, Ill. KARL E. WENK, *Assistant Secretary*, 228 Marlborough Street, Boston 16, Mass.

## 1943

The mailbag this month has been larger than in any other past month. Among the letters received is one from the M.I.T. Alumni Fund showing contributions from the various classes for the first six months of the 1943-1944 Fund. Our quota has been set at 220 contributors (roughly a third of the Class), and 43 per cent of that quota had been reached by September 30.



1943 Continued

Not only does your contribution go to a Fund designed to improve and increase the facilities at the Institute but it also pays for your Review subscription. I know you will derive considerable satisfaction from the class notes column. On the ball now '43; let's do better than 100 per cent of our contribution quota.

I received the following letter from Jim Malloch: "I was glad to read the class notes and found much of interest. I hope the job of being general secretary does not restrict your free time too greatly. Bill Cain, Ed Dunbar, and I were assigned to Camp Santa Anita, Calif., directly after receiving commissions from the Ordnance officer candidate school at Aberdeen Proving Ground. We are in different companies but are quartered together in the bachelor officers' quarters on post. Each of our companies has been activated recently, so we are plenty busy with a training schedule."

From Bob Miller, who was in the same officer candidate class as Jim, came the following: "I finished O.C.S. on May 29 with Fred Perry, Bob Bamford, and Dick Stern. Most of the other fellows finished the previous week, as we three were in the hospital for about a week. Ray Dunn, who married Jane Clark of Rochester, N.Y., on May 25, was sent to the Frankford Arsenal in Philadelphia. Dick Zeamer went to the tank automotive center in Detroit.

"I am with an Ordnance motor vehicle assembly company, which is one of the hottest outfits in the Army today. As you probably know, practically all vehicles are packed to take up the least amount of shipping space, as they have to be assembled in vast numbers overseas. This makes plenty of work for our outfit. You may think that because we do this type of work we don't get much basic soldiery, but, on the contrary, we get the toughest training, including judo, bayonet practice, rifle- and machine-gun marksmanship, and plenty of hand-to-hand fighting."

I have a letter from Dick Haas which tells its own story. He wrote: "I am now in preflight school at Maxwell Field, Ala. I spent about 10 days at Atlantic City, 11

weeks at Massachusetts State College in an Army college training detachment, and then 7 weeks at the Army air center at Nashville, Tenn., where I was classified for pilot training.

"While in Nashville, I looked in the servicemen's college register at the Hotel Hermitage and noticed that Lieutenant Steven Heller had been there a few days before. I didn't get to see him, though. Hugh Pastoriza is at Camp Crowder, Mo., in radio school and will go to officer candidate school when he finishes there."

When we mention men in the various armed services, we can't forget the Marines, and so Lieutenant Ray Richards tells us the following: "When I last wrote you, I was stationed in the Marine Corps procurement office in Boston, but since the first of August I have been going to school at Harvard. It is a tough grind, but I guess I'll make it all right. After a few months at Harvard, I'll go to Technology for about three months, and from there it is anyone's guess.

"Also at Harvard in this course, though not in my class, were Charles Lawson (Army), Ed Lord (Navy), and Doug Fenton (Navy), all of whom are fellow Course XV men. (They'll make engineers out of us XV men yet.) Also there were Bob Nelson and Paul Hotte, both of whom are Army men. We were all agreed that the Technology training is invaluable preparation for such an intensive course as this. Ed Lord was married in July.

"Other '43 men I have run into lately are Stan Porosky at Camp Edwards, Mass.; Gus Root, who is a civilian employee doing Army test work at Wright Field; Bill Thurston, who is doing development work with the General Radio Company; and Don Ross, who is working in the wind tunnel at the Institute. Bill, by the way, tells me that Ken Wadleigh is still in Navy indoctrination school at Princeton. Until recently, Don and Dick Childerhose had a room in the same house, and when they came in at 6:00 A.M. I could never keep track of whether they were on the night shift or just coming home after a big night. Naturally, I guess it was a night shift. [The Secretary is chuckling.] Dick

works for the United Aircraft Corporation and until recently worked in the wind tunnel at the Institute. Now he has gone back to Hartford. He had been trying all summer to get into the Marine Corps and has finally been accepted.

"That is about all the dope I have on the Class. I guess we are pretty well scattered by now. I am enclosing a list sent to me by Harvard showing all the Technology men now there."

The list which Ray mentions is from the Phillips Brooks Association at Harvard. The association has turned its facilities into a lounge for Army and Navy officers. Among its clientele were the following men from our Class: Charles Loomis, Leo Duval, Myron Shoffner, Bill Bright, Doug Fenton, Warren Schwarzmenn, Charles Lawson, Alphonse Hotte, Ken Gifford, Ray Richards, and Ed Lord.

From Hugh Parker's father I received a note telling me that Hugh is in India with the American Field Service. You will recall that Cal Dunwoody is in India with the same service. I have also a very official-looking document from the Army Air Forces navigation school which tells us that Richard D. Wilson has reported to the navigation school at San Marcos, Texas, for 18 weeks of training in advance aerial navigation. This will lead to a commission as second lieutenant or appointment as a flight officer. According to the document, Dick will fly more than 15,000 miles in practice flights during his training.

All the Navy news I have is that Howard Bollinger has recently been commissioned an ensign and assigned to duty in Chicago. — The news from the West Coast is that Yet Lin Yee is a design-analysis engineer with one of the aircraft manufacturers there. Be sure that you keep up the good work, Yee.

Finally I have some information on the doings of Cupid. Belated news is at hand saying that Bill Kittredge and Margaret Lambie became engaged last June. On September 18, Waldo Davis and Katharine Magee were married in Scarsdale, N.Y. — CLINTON C. KEMP, *General Secretary*, Officer Candidate School, Aberdeen Proving Ground, Md.

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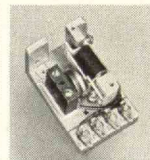
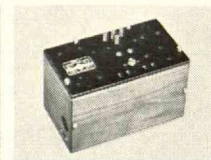
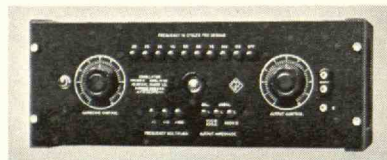
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